

THE MILLING WORLD

AND

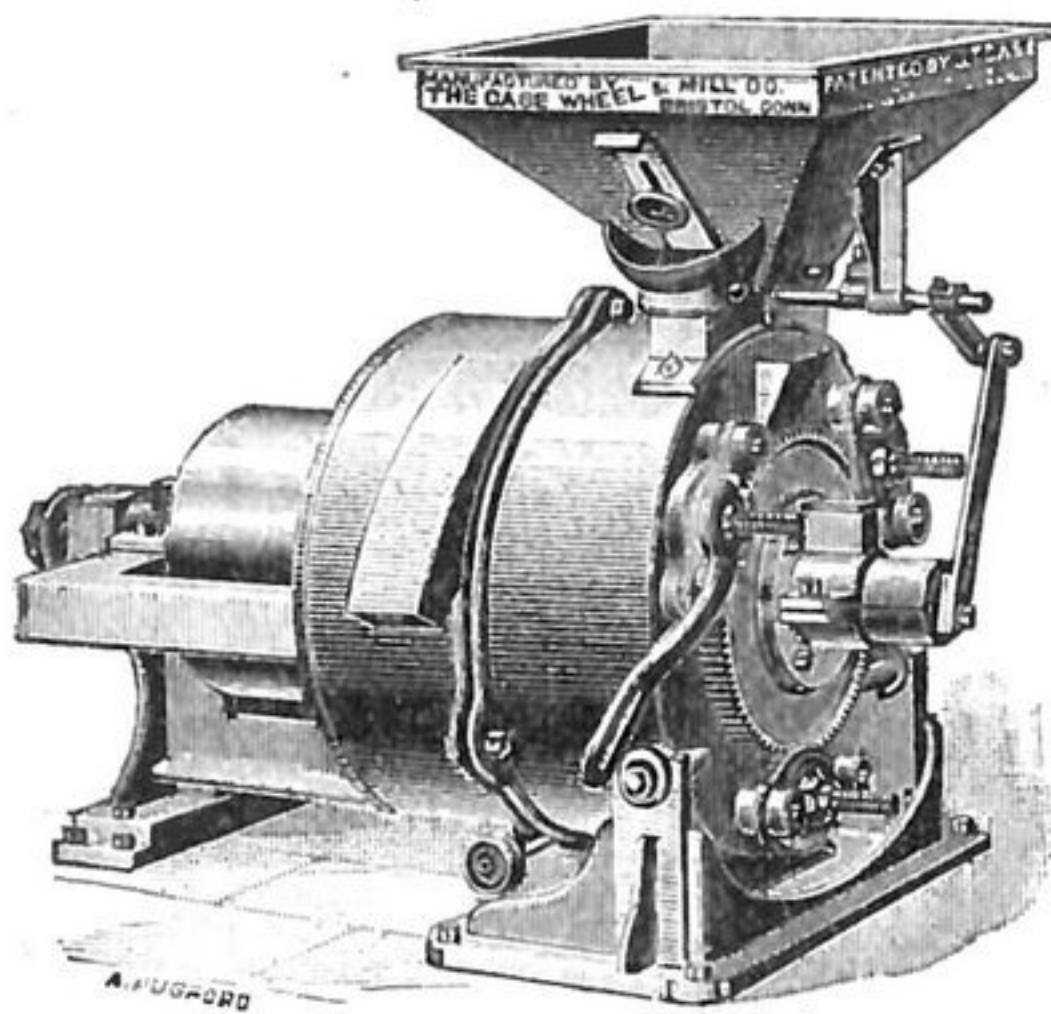
CHRONICLE OF THE GRAIN AND FLOUR TRADE

PUBLISHED EVERY MONDAY MORNING.

VOL. XIX. No 25.

BUFFALO, N. Y., FEBRUARY 18, 1889.

\$1.50 PER YEAR.



VICTORY OVER ALL OTHERS. SINGLE & DOUBLE VERTICAL GRINDING MILLS.

(J. T. CASE'S PATENT.)

FACTS ARE MIGHTIER THAN ASSERTIONS. READ WHAT THEY SAY:

"Our 20-inch mill made by the Case Wheel & Mill Co. is in every respect satisfactory, easy to handle, and best results obtained of any mill in the country, with same quantity coal and power."—A. S. RUSSELL & Co., Meriden, Conn.

"Superior to any mill in use."—Geo. WESTON, Bristol, Conn.

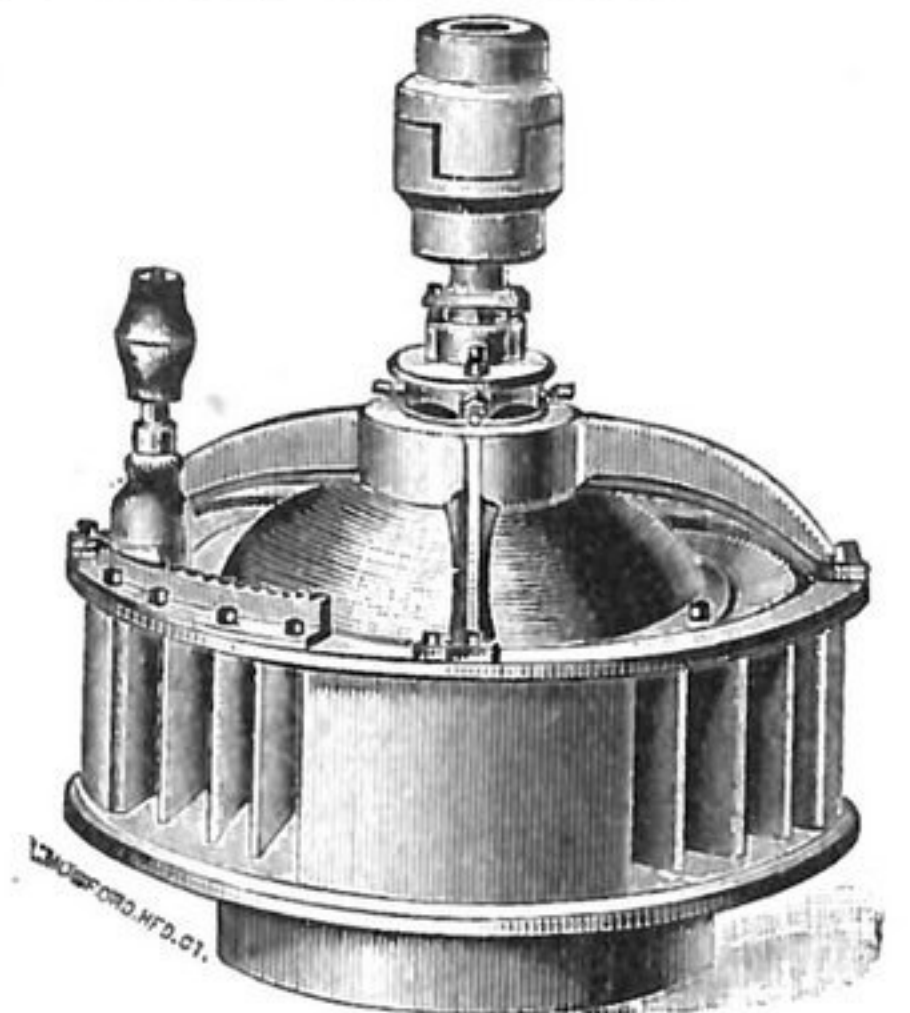
"The best satisfaction in quantity and quality."—CHILD'S ELEVATOR, Manchester, Ct.

"We take pleasure in recommending it."—GARLAND LINCOLN & Co., Worcester, Mass.

SEND FOR CATALOGUE—ILLUSTRATED AND DESCRIPTIVE.

The Improved National Turbine Water Wheel

The Best for Economy; The Best for Durability; The Best for Power. ONE THOUSAND FIVE HUNDRED NATIONAL WATER WHEELS IN USE Prove that our Assertions are Supported by the Leading Manufacturers in the Country. Send for illustrated catalogue and prices to the manufacturers.



The Case Wheel & Mill Co., Bristol, Conn.

NOTICE.

The J. B. ALLFREE CO., INDIANAPOLIS, IND., wish to inform their milling friends and the trade in general that they are prepared to build and equip throughout mills of any capacity in a style that can not be excelled. Bolting Cloth Trade a Specialty.

COMPLETE OUTFITS

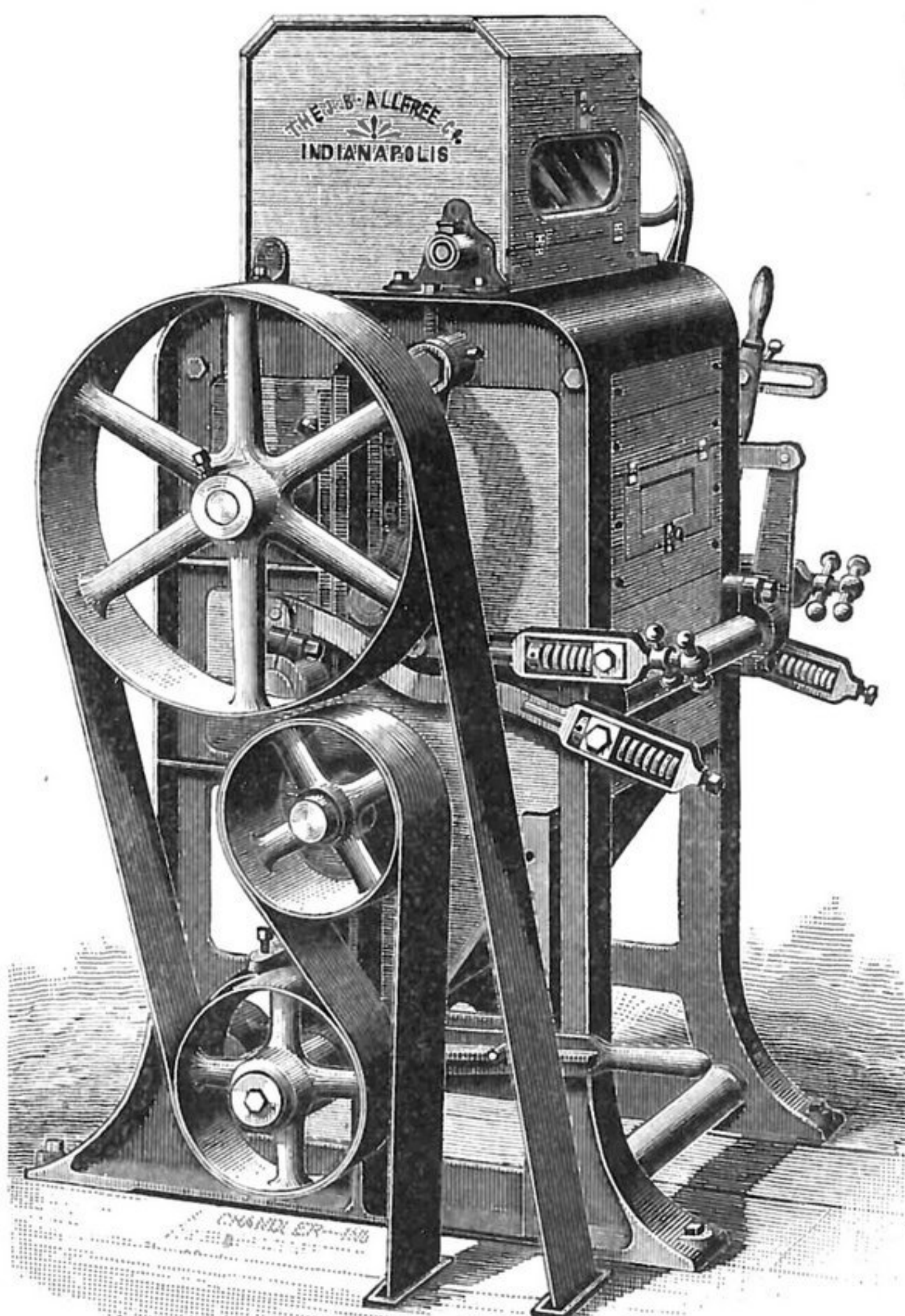
—FOR—

CORN-MEAL

—FURNISHED AT—

LOW PRICES.

Millers interested in Hominy and Germless Goods will do well to get prices from us on the Keystone Huller and Pearler.



—WE MANUFACTURE—

AUTOMATIC ENGINES.

The Keystone Four Roller Wheat Mill.

The Keystone Four High Roller Mill.

The Success Bolter and Dresser.

The J. B. Allfree Purifier.

The J. B. Allfree Sieve Scalper.

The J. B. Allfree Co.'s New Bolting Chest.

The J. B. Allfree Centrifugal Reel.

The Climax Bran Duster.

The Allfree Flour Packer.

The Keystone Huller and Pearler.

ADDRESS FOR ILLUSTRATED DESCRIPTIVE CATALOGUE.

The J. B. Allfree Co., Indianapolis, Ind.

RIGHT TO THE POINT

"The best laid plans o' mice and men
Gang aft aglea."
But the Case Mill gets there every time,
So all the millers say.



"WE PUT IN A CASE SHORT SYSTEM MILL."

Old father Wise, with twinkling eyes,
Points backward to the well-filled till,
While Thrifty scans the new made plans
To double up the CASE SHORT MILL.



"WE DIDN'T!"

Old Shiftless weeps—the sick cat sleeps,
Doolittle has gone out to pray,
The spiders fill the empty till,
While hungry rats now hold full sway.

JUST TAKE A LOOK AT WHAT THIS MAN WRITES:

THE CASE MFG. CO., COLUMBUS, OHIO.

ELYRIA, OHIO, OCT. 10, 1888.

Gentlemen: Enclosed please find settlement in full of my account. The 4-break mill works splendid and am well pleased with it. The Inter-Elevator Flour Dressers are everything you represent, both in capacity and excellence of work. The Special Purifiers are a fine machine and far ahead of the Purifiers you put in my other mill in '83. Am especially pleased with the millwright work. It is well planned and finished in a good, workmanlike manner. I can not praise your millwright and his work too highly.

Yours resp'y,

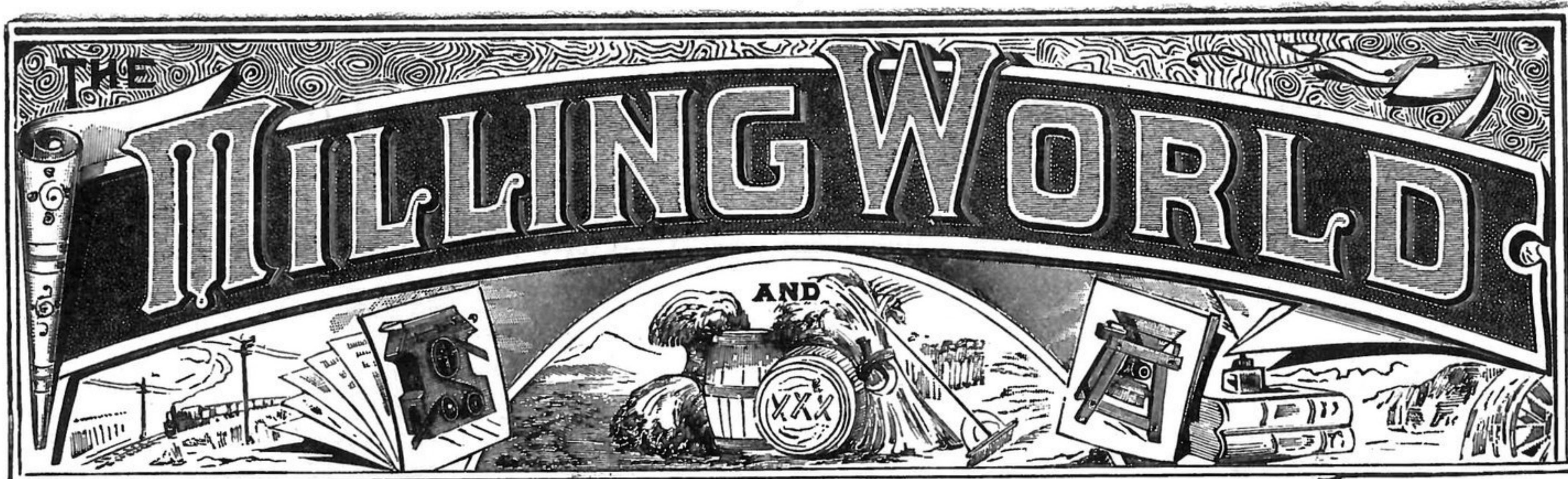
GARRET REUBLIN.

If you want a successful mill write us. Long System Mills remodeled on short notice. Case Short Break Corrugations put on any make of rolls. Our Roller Corn Mills are a most profitable investment. Now is the time to put one in your mill. Our Aspirator and Purifier for Corn Meal will astonish you. Belting, Gearing, Elevator Supplies, Silk and Wire Cloths shipped promptly on receipt of order. If you want mill supplies of any kind write us. Estimates on mills of any desired capacity furnished on short notice. Write us at once and state the capacity wanted and number of grades of flour you wish to make. The Automatic Feed on our machines makes them superior to all others. Catalogues and Circulars Mailed on Application.

RE-DRESSING ANY MAKE OF ROLLS PROMPTLY A SPECIALTY.

THE CASE MANUFG. CO., COLUMBUS, OHIO.

PLEASE MENTION "THE MILLING WORLD."



CHRONICLE OF THE GRAIN AND FLOUR TRADE

PUBLISHED EVERY MONDAY MORNING.

VOL. XIX. No. 25.

BUFFALO, N. Y., FEBRUARY 18, 1889.

\$1.50 PER YEAR.

DURING the month of January the fire-losses in the United States and Canada footed about \$6,900,000. The milling and grain interests contributed \$300,000.

AFTER looking over the markets and the general situation in grain and flour lines, an exchange remarks: "That the supply of good sound, merchantable wheat in this country is getting scarce is being manifested in the quality of the flour coming to market. Fully one-half of the receipts of winter-wheat flour are more or less of unsound quality, and in spring-wheat flour, says an expert in flour, the use of more or less frosted wheat can be detected." And yet wheat goes down, and flour goes down, and the bears say that the bottom is yet away down, while the bulls appear to be paralyzed. It is a queer situation!

SANGUINE British grain importers are now claiming that the "great" wheat crop of the Argentine Republic will furnish "fully 3,000,000 bushels for export." The "great" wheat crop of Manitoba continues to be unheard-of. So it goes. One after another of the "great" wheat-growing rivals of the United States demonstrates its unreliableness as a source of supply. Events appear to confirm the contention that the United States is really the one "great" country upon which dependence may be placed for a liberal export supply of fine wheat. Other countries are "great" only by allowance, not by comparison with the United States.

EXPERIMENTS with frosted seed wheat in the Northwest can prove little or nothing. The experiments are conducted in winter, in artificially heated greenhouses and in specially fertilized soil, and the results are not an indication of what might be reasonably expected of the same seed sown out of doors, on the prairies, on average soil, and exposed to all the changes of climate that are to be expected in the spring-wheat areas. In every case where a northwestern farmer can secure unfrosted wheat for seed, he should do so. Let the dubious seed go to the greenhouses for scientific experiment. Farmers who are wrestling with the elements for a living can not afford to invite probable disaster.

MINNEAPOLIS adheres to the position assumed months ago on the crop of 1888. Mr. Charles A. Pillsbury, of that city, was on 'Change in New York the other day, and in conversation he said that the stocks of flour and wheat in Minneapolis are about the same as a year ago, but that in the Northwest there is not half the wheat there was a year ago, and that the flour-mills could not increase their present output and keep running until another crop, as they could not get enough wheat to grind. When asked about the position of the Chicago speculative market for wheat, he said he was not at liberty to talk, but that the bears would find before another crop that what he told them last fall of this crop was true. We believe it will be well for the speculators to heed what Mr. Pillsbury says. If any man in the Northwest understands the situation, he is the man, and if the speculators disregard his statements they will have only themselves to blame for misfortunes that may come upon them in the near future. At present every feature of the

situation points to higher instead of lower prices for wheat, and Mr. Pillsbury evidently does not intend to unload the wheat he has on hand.

WHATEVER else may be said of the years 1887 and 1888 in connection with milling matters, it must be admitted that those two years witnessed the trial and the adoption of the short system of milling. It seems but a day since the short-system men were being denounced as cranks, quacks, frauds, fools, rogues, maniacs and disreputable individuals generally, while their system was pronounced hopelessly wrong and incurably foolish. Now that is all ended. To-day reputable mill-builders advertise plans for short-system mills, and more than one prominent mill-furnishing firm has made a specialty of short-system mills. The opponents of the short system started out, or in, to kill the movement by misrepresentation, but Abernathy and his followers went steadily on, piling up a mountain of facts and recorded achievements, under which are buried those who generously gave the short system movement six months in which to die. The short system may not mean a revolution in American milling, but it is an established thing, with an acknowledged leader, an interesting history, an instructive literature and hundreds of establishments in full operation proving its right to existence and consideration.

COUNTRIES in the southern hemisphere are having hard times with their crops of wheat. The crop now being harvested in Australia is a remarkably poor one, thousands of acres yielding only three bushels to the acre, while seven bushels may be considered a large yield for the whole Australian country. Two months ago the Argentine Republic was said to promise a crop that would supply all home demands and furnish 10,000,000 bushels for export. The harvest season was a wet one and at this writing the indications are that Argentine will have no surplus at all for export. Chili is below her usual average, and in New Zealand and other wheat-growing countries the present crop is confessed to be short in quantity and defective in quality. In the warm portions of the northern hemisphere the indications for the March and April harvests are by no means encouraging. India will harvest in late March and early April, and, despite the reported large increase in acreage and the steady reports of favorable conditions in general, the most hopeful dealers do not now expect that India will be able to export as much on this crop as on that of last year. Thus it would seem, at this time, that once again the great wheat importing countries of the northern hemisphere will be compelled to rely for their supplies mainly on the wheat-growing countries of the northern hemisphere. In the United States the area planted to winter wheat, the reported condition of the grain under the snow, the preparations to extend the spring-wheat area, and the general outlook indicate a largely increased production. In Russia the indications favor large increases in acreage, and every European country is ready to increase its wheat area to the uttermost. The failure in the southern hemisphere will be more than offset by the increase in the northern hemisphere if the weather permits an average or abundant crop to mature.

The Canton Cabinet Filing Case Company, Canton, Ohio,

MANUFACTURERS OF

The New Buckeye Document Case & Letter File; Also All Kinds Office Furniture



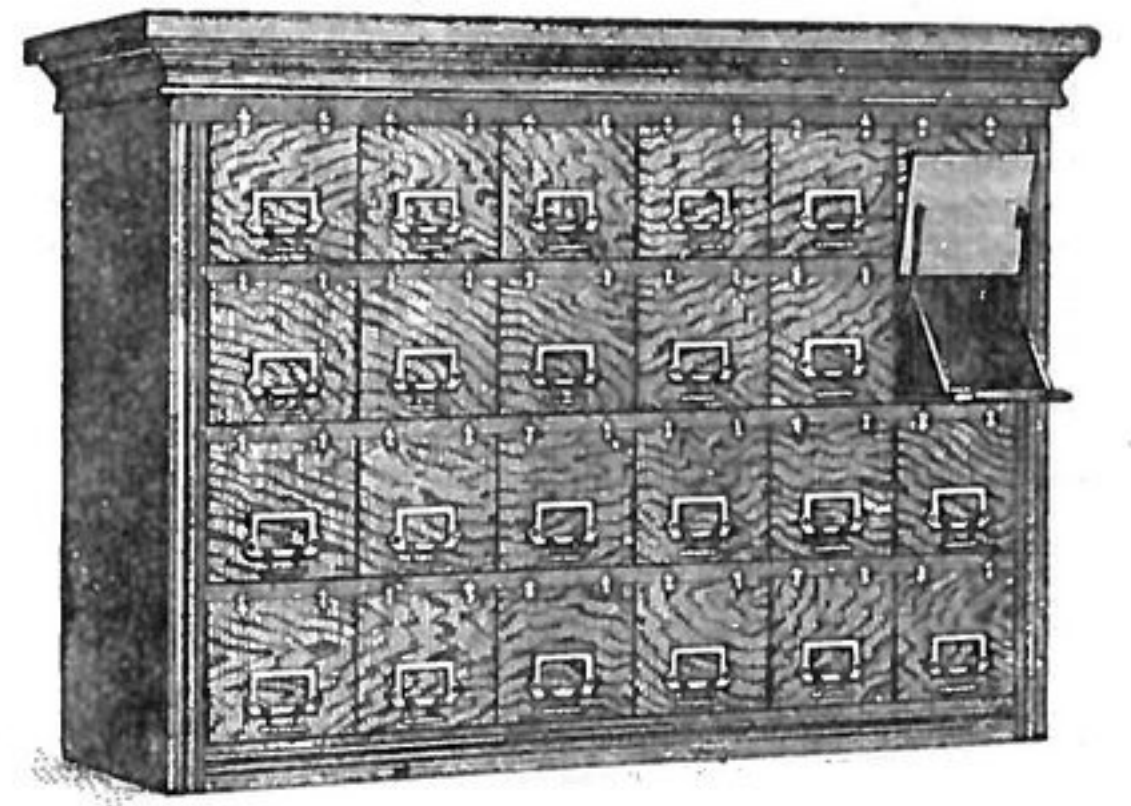
NO. 8.

NO. 8 Represents one side of one of our Revolving Cabinet Letter Files and Document Cases Combined. It contains 30 Document Drawers and 8 Letter File Drawers. In filing letters we use first VOWEL of name on front of drawer, and LETTER FOLLOWING first VOWEL on Index Sheet within drawer. We also make more exhaustive systems which contain from 6 to 100 or more Filing Drawers.

NO. 1 Represents one of our small Document Cabinets, for use on desks or brackets. Action of drawer can be seen in the cut. When front is raised inner drawer comes forward, exposing contents of drawer for inspection.

Our Cabinet Files are Conceded to be the Most Convenient of Any in the Market. They are Compact, Simple, Complete, Durable and Ornamental.

SEND FOR PRICE LIST AND CATALOGUE.



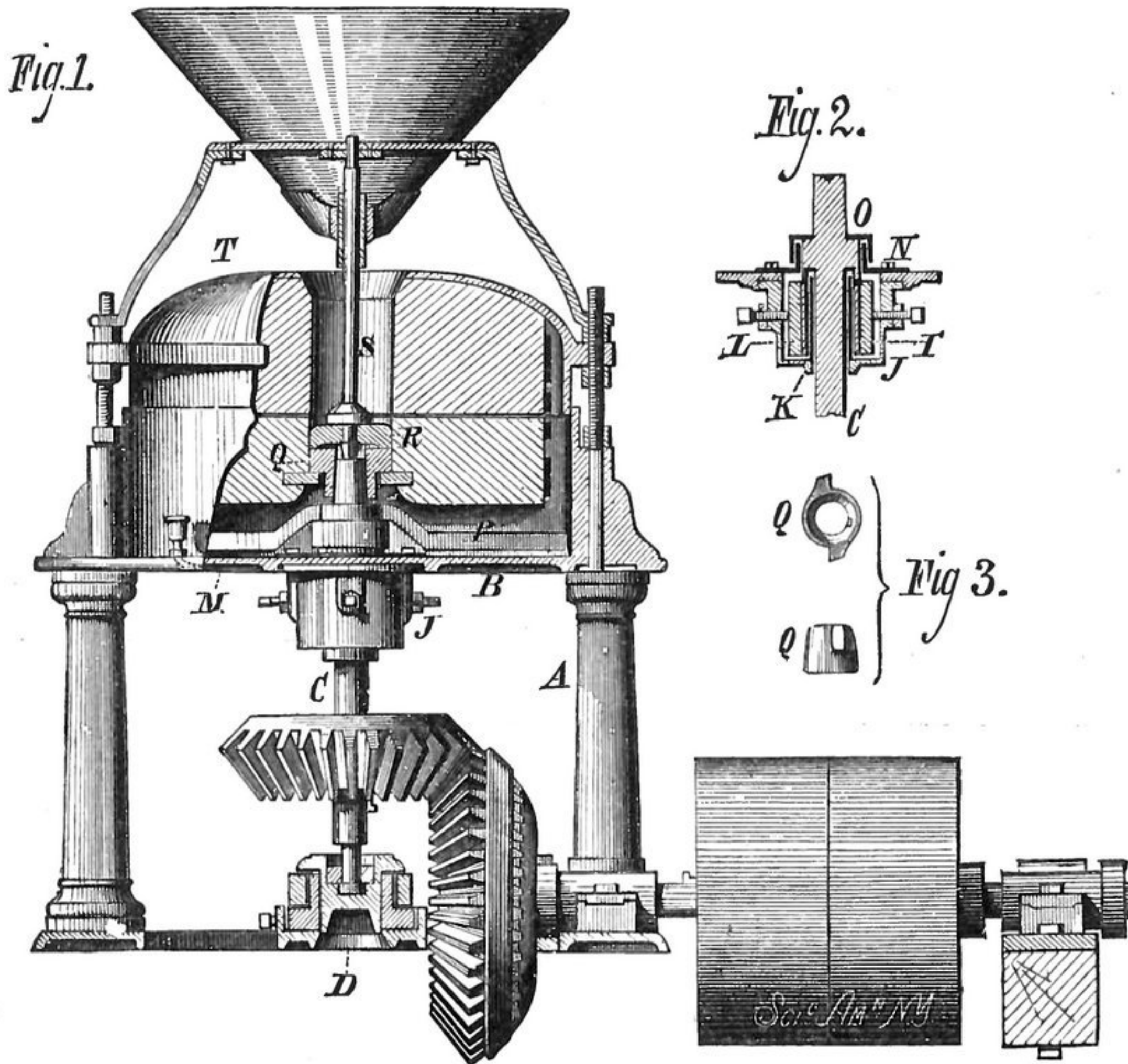
NO. 1.

MUNSON'S PORTABLE MILLS

With all of the Latest Improvements. Indorsed by the Best Mechanical Experts and Engineers. Every mill warranted; Every mill fully inspected: Every mill placed on its merits; Satisfaction guaranteed. Thousands in use; Best of references given.

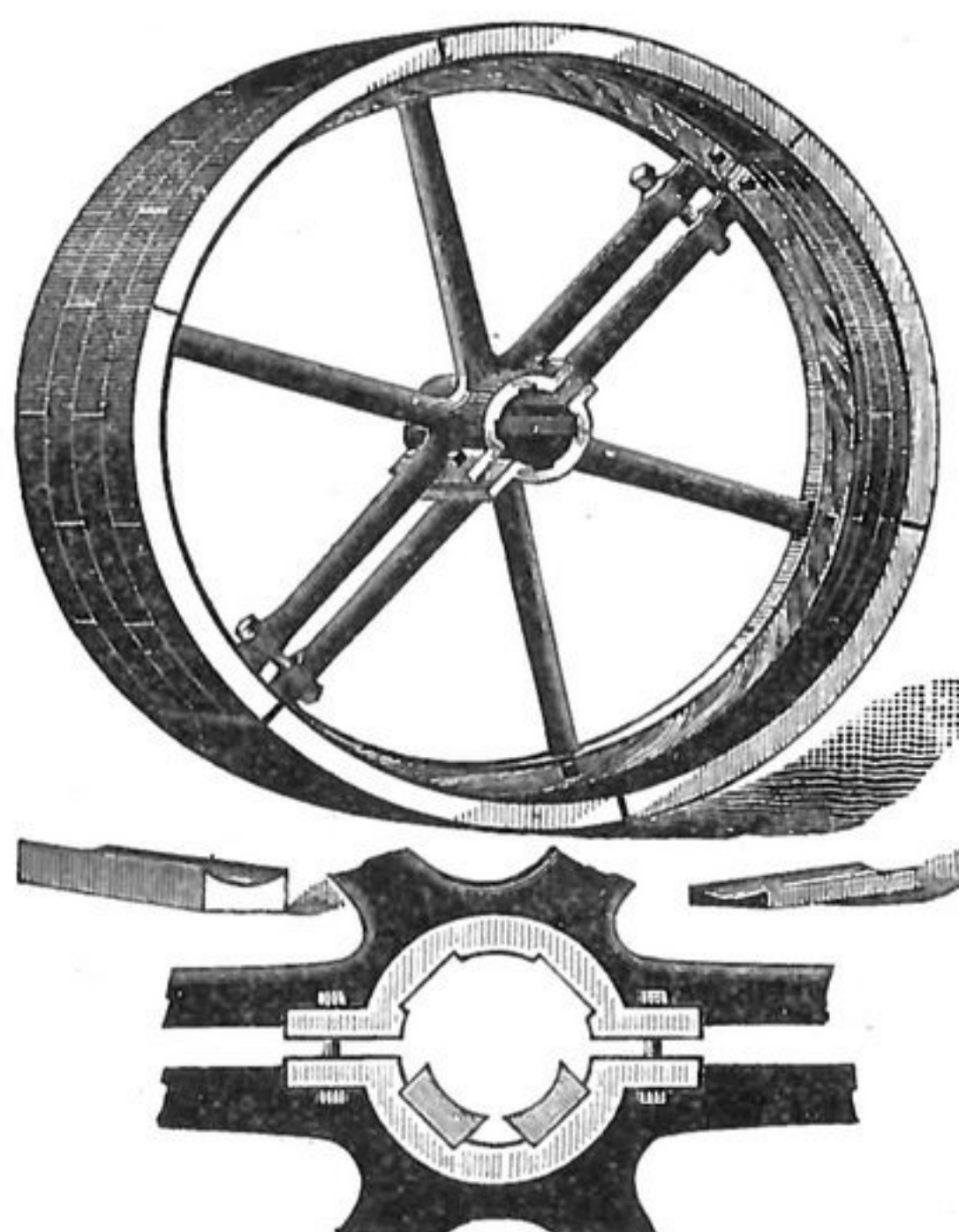
IN USE BY THE LARGEST CORN GRINDERS IN THE WORLD.

MUNSON'S PATENT SPINDLE.
MUNSON'S PATENT EYE.
 IMPROVED BUSH AND COLLAR,
 CURBS, SILENT FEEDERS, ETC. ETC.



DOUBLE GEARED WITH COUNTER-SHAFT,
 Tight and Loose Pulleys,
 BEVEL SHELL WHEEL & PINION.
 Write Us for Prices and Discounts.

Munson Brothers, Utica, N. Y.



C. H. BIRD & CO., KALAMAZOO, MICH.

MANUFACTURERS OF PATENT

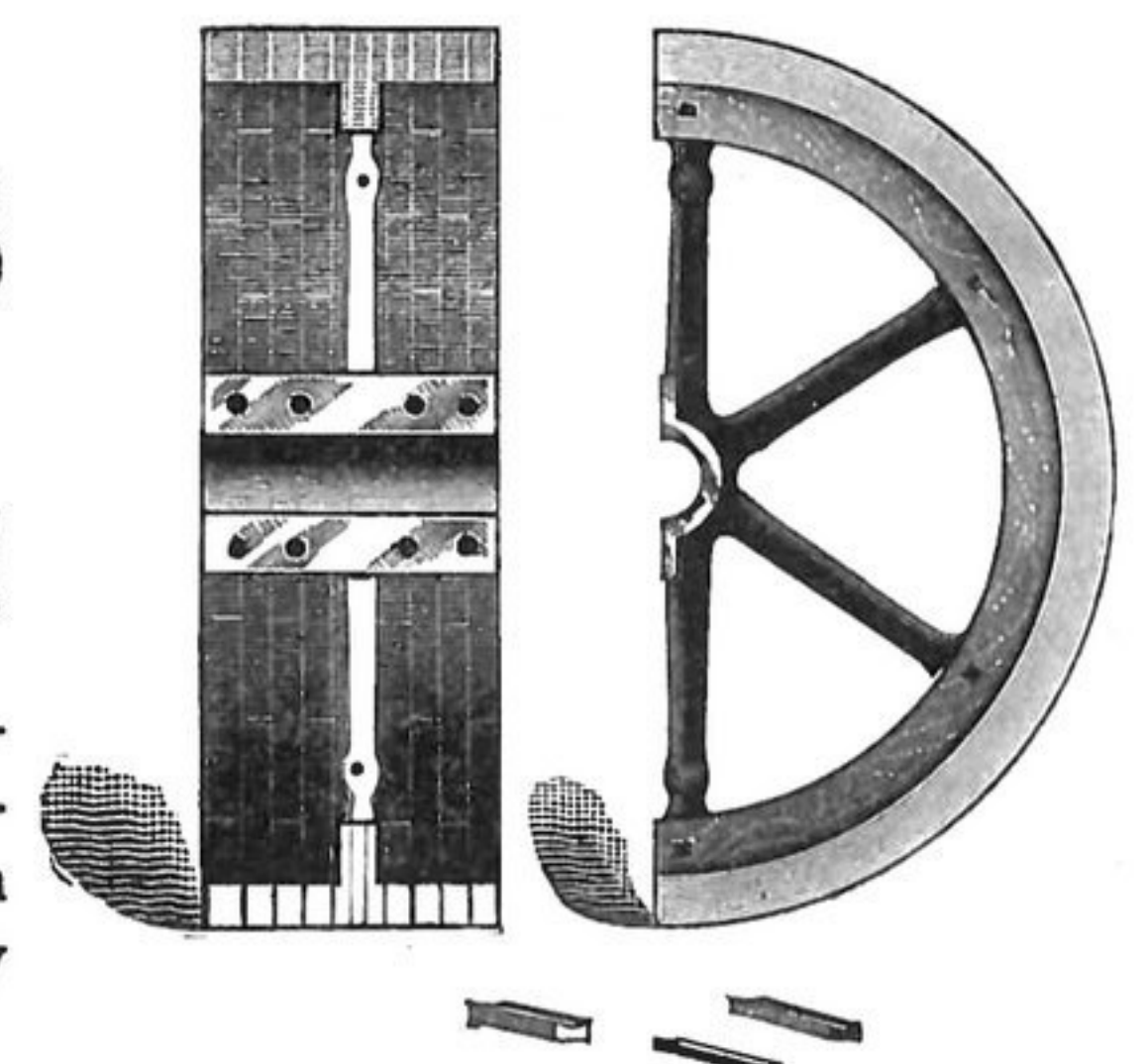
Wood Split Pulleys

WOOD RIM WITH IRON ARMS.

The Best Pulley on Earth!

Is very easily and quickly adjusted to Shaft. Has Patent Iron Bushings Interchangeable, to Fit Different Diameters of Shafts. Has FOUR or SIX Bearings on Shaft. This fastening never slips. Every Pulley strongly built and perfectly balanced.

SEND FOR CATALOGUE AND PRICE LIST.



THE MILLING WORLD

AND
CHRONICLE OF THE GRAIN AND FLOUR TRADE

PUBLISHED EVERY MONDAY. OFFICES: { Corner Pearl and Seneca Streets,
Over Bank of Attica.
McFAUL & NOLAN, - - - PROPRIETORS.
THOMAS MC FAUL. JAMES NOLAN.

SUBSCRIPTION.

In the United States and Canada, postage prepaid, \$1.50 Per Year, in advance; remit by Postal Order, Registered Letter, or New York Exchange. Currency in un-registered letter at sender's risk.

To all Foreign Countries embraced in the General Postal Union, \$2.25 Per Year, in advance.

Subscribers can have the mailing address of their paper changed as often as they desire. Send both old and new addresses. Those who fail to receive their papers promptly will please notify at once.

ADVERTISING.

Rates for ordinary advertising made known on application.

Advertisements of Mills for Sale or to Rent; Partners, Help or Situation Wanted, or of a similar character One cent per word each insertion, or where four consecutive insertions are ordered at once, the charge will be Three cents per word. No advertisement taken for less than 25 cents. Cash must accompany all orders for advertisements of this class.

Orders for new advertisements should reach this office on Friday morning, to insure immediate insertion. Changes for current advertisements should be sent so as to reach this office on Saturday morning.

EDITOR'S ANNOUNCEMENTS.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trades.

Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.

This paper has no connection with a millfurnishing house and aims to represent the trade without prejudice, fear or favor.

Address all communications

THE MILLING WORLD,
BUFFALO, N. Y.

Entered at the Post Office, at Buffalo, N. Y., as mail matter of second-class.

SITUATIONS WANTED.

Advertisements under this head, 25 cents each insertion for 25 words, and 1 cent for each additional word. Cash with order. Four consecutive insertions will be given for the price of three.

WANTED.

A situation in a mill, by a married man of steady habits; 34 years old; no children; had three years' experience in a custom mill; can furnish best of reference. Address, CHAS. BETTIS, Forestville, N. Y. 24tf

WANTED.

Situation in a Roller Mill as apprentice or assistant miller. Have 2 years' experience. Am willing to work and want to get to the front. Address, "TWO YEARS," 607 E. First street, Des Moines, Iowa. 25

SITUATION WANTED.

By a practical miller; either stone or rolls; twenty-five years' experience. Will work on salary. Would rent a good mill or buy an interest in a good mill. Can give the best references as first-class. M. V. STRAIT, Howard, N. Y. 2225

SPECIAL ADVERTISEMENTS.

Advertisements of Mills for Sale or Rent, Partners Wanted, Machines for Sale or Exchange, etc., etc., cost 1 cent per word, for one insertion, or 3 cents per word for four insertions. No order taken for less than 25 cents for one insertion, or 50 cents for four insertions. Cash must accompany the order. When replies are ordered sent care of this office, 10 cents must be added to pay postage.

SAFE BUSINESS INVESTMENT.

A party owning flouring mill, with modern most approved machinery, doing large, profitable, local and merchant business, well established, located in growing city, population 12,000, Western New York, desires to associate more active capital. Correspondence solicited. Address, BOX 787, Waukesha, Wis. 18tf

FOR SALE.

- 10 Single Sets 9x30 Stevens Rolls.
- 2 Single Sets 7x12 Ferriers Rolls.
- 2 Centrifugal Reels.
- 2 No. 8 Niagara Bran Dusters.
- 2 No. 8 Prinz Dust Collectors.
- 1 No. 4 Hunter Purifier.
- 1 No. 6 Garden City Purifier.
- 1 No. 1 Pyne Purifier.
- 1 No. 8 Richmond Brush Machine.
- 1 No. 2 Silver Creek Scourer.
- 1 No. 00 Becker Brush Machine, over 50 Run Millstones all sizes, all complete.

Above Machines are in first-class condition and practically as good as new. Address J. B. DUTTON, 115 E. Fort Street, Detroit. 18tf



HORIZONTAL (underrunner.)

If you are desirous of obtaining the best Mill or Cob Crusher, send for our catalogue and be convinced that our's fill the bill. Can not fail to please you. They are guaranteed to prove as represented.

C. C. PHILLIPS,
OFFICE, 20 SOUTH BROAD STREET,
PHILADELPHIA, PA.

MILL MACHINERY FOR SALE.

One 24-Inch Portable Mill, wood frame, capacity 15 to 20 bushels per hour; new, best make.
One 20-Inch Portable Mill, iron frame, capacity 12 to 16 bushels per hour; new, best make.
One No. 0 Standard Combined Separator, Smutter and Brush Machine; new, best make.
One 18-Inch Vertical Portable Mill, French Buhr Stone, hung on horizontal shaft; capacity 25 to 40 bushels per hour; new, best make.
One 14-Inch Vertical Feed Mill; best make, new, a bargain.
One No. 6 Dustless Separator; new, a bargain.
Two No. 4 Scientific Grinding Mills, capacity 40 to 50 bushels per hour; new.
A Lot of Elevator Buckets, brand new, best make, any size desired, very cheap.
One No. 1 Full Rigged Combined Dustless Separator; new, a bargain.
Four Corn Cob Crushers, right or left hand, driven from above or below, best make; capacity 40 to 60 bushels per hour.
For particulars address, FRANK SMITH, care of THE MILLING WORLD, Buffalo, N. Y. 5tf

FOR SALE.

Three-run mill, repaired, and a first-rate dwelling house, built last summer. I don't owe one dollar, but will sell cheap for cash, to build a mill in Forest county. Address J. S. PORTER, Lamartine, Clarion county, Pa. 2225

FLOUR MILL FOR SALE.

Water power custom and merchant mill; 2-run 4½-feet buhrs, well fitted up; doing large business; 52 miles from New York; close to depot; good reasons for selling. JOHN ORR, Mountainville, Orange county, N. Y. 2225

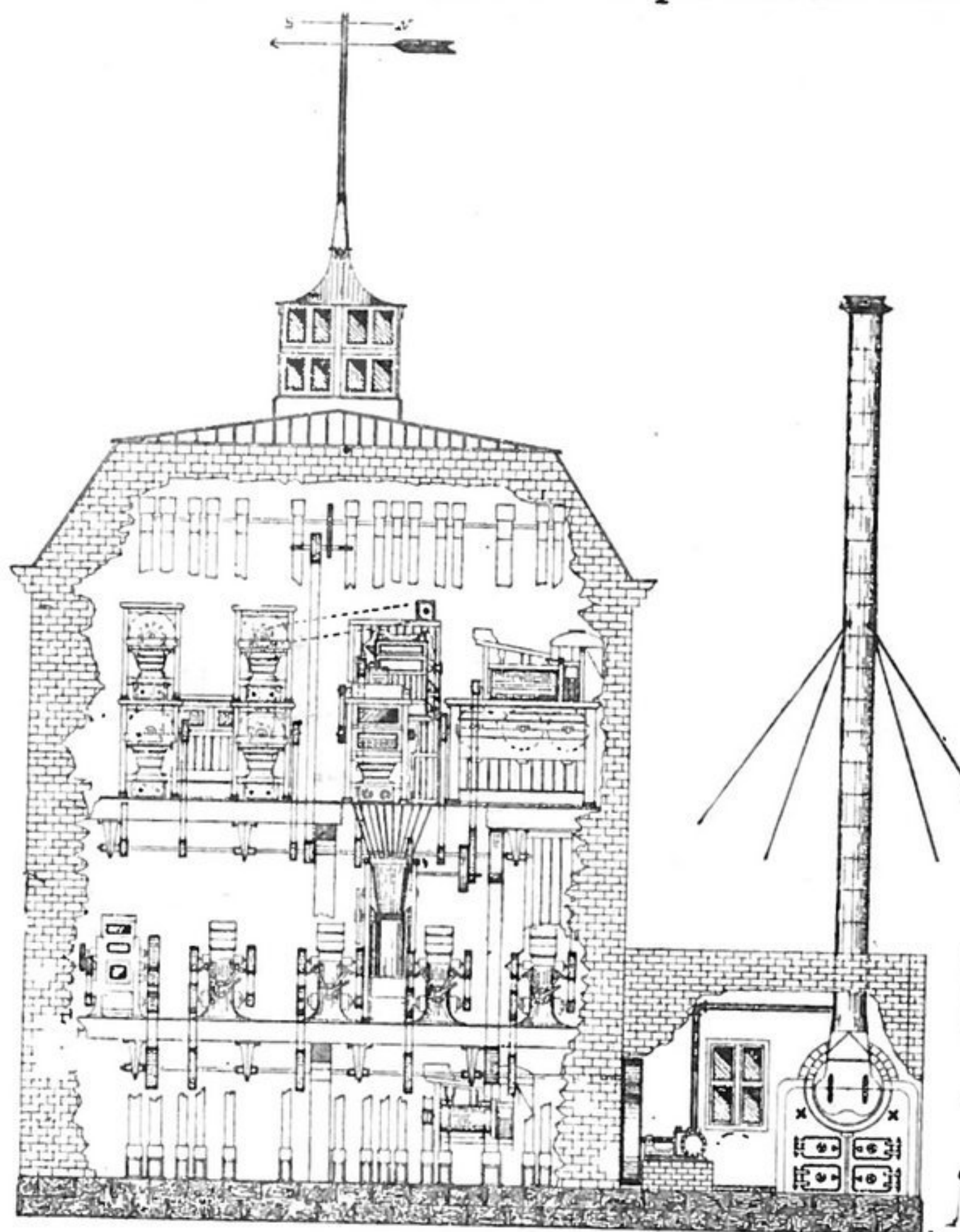
MAY wheat is to be made the subject of a "big squeeze," so the reports go. The Chicago speculators, who have been and are now "hammering" the May option down below the dollar notch, are said to be preparing to push the price up to \$1.10, at least, and as much higher as the expected panic will allow it to be pushed. With all the warnings thrown out in advance, there is no reason why investors should be found in the proposed "squeeze" when it comes. Those who go into the deal go in because of avarice, and when they come out, dilaniated and deracinated, from the diminutive termination of the cornucopia, waste no crocodilian lachrymal salinaqueous globules over them. They will deserve all they get.

ONE by one the competing phantoms fade. Australia was several years ago declared to be able to destroy the wheat-growing business of the United States. To-day, right at the close of the Australian wheat harvest, Australia is importing wheat and other grains from the United States. A British corporation spent over a million of dollars in a gigantic flouring-mill at Rio de Janeiro, Brazil, which was to grind only wheat from the Argentine Republic. The present harvest in the Argentine Republic was spoiled by a shower, and the great British mill at Rio de Janeiro, Brazil, was last month caught buying wheat in New York! The world in general, and the wheat-importing countries in particular, will after a time learn that the one reliable wheat country in the world is the United States. Meantime, bring out all the reserves of wheat-growing specters and let them all be seen and sized up at one glance.

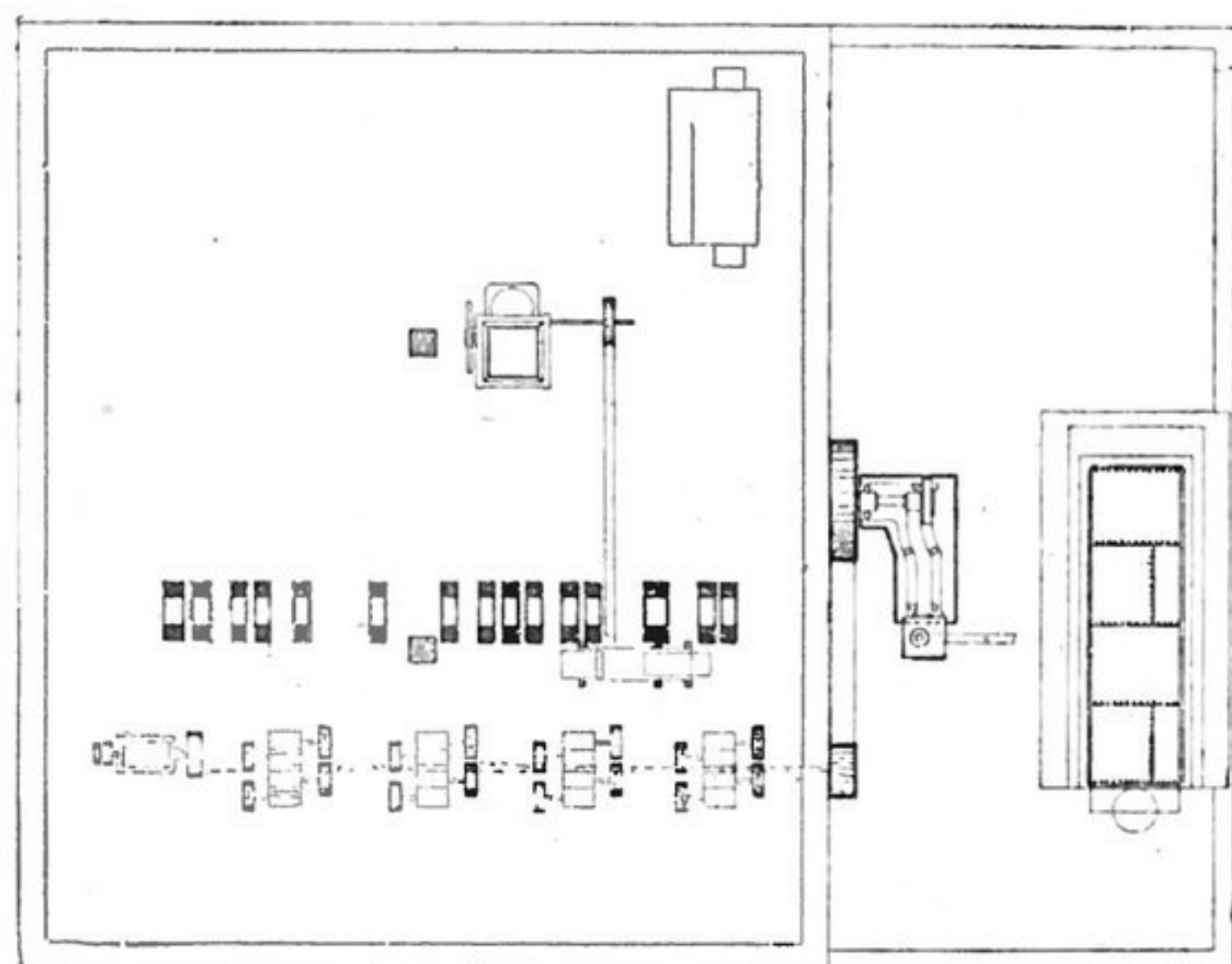
CERTAIN of our esteemed cotemporaries have really at times appeared to think that the "shut down" proposed at the Milwaukee banquet would result in wonders in the way of relieving a congested flour market and of advancing prices. We have freely asserted that merely restricting output would not accomplish either of those points. For that we have been criticised as having been unfriendly to the meeting at Milwaukee. Well, the event has justified our assertion. Taking it for granted that the mills represented at the Milwaukee banquet have really restricted output as they agreed to do, what is the outcome? The restrictionists said that the "shut down" would relieve the congested markets. The New York market reported on February 1 a total stock of 453,195 barrels of flour, against 344,475 barrels on January 1, an increase of 8,720 barrels in one month! So much for that point. What has been the result in prices? Ever since the "shut down" began, prices for flour have decreased perceptibly, the decrease reaching nearly 20 cents a barrel. So much for that point. Equally disastrous has been the agreement not to consign flour abroad. The markets usually receiving the American consignments have found supplies elsewhere. The grand total result up to date has been a large increase in the stocks at the principal shipping port, a decided decrease in the value of both flour and wheat, and a loss of business in foreign markets. Are the restrictionists happy, contented, prosperous and satisfied that the best way to do business is to cease doing it? Can they not conjure up some new plan equally futile?

THE ALLFREE SHORT SYSTEM MILL.

Particular attention is called to the outline plans of a cheap short-system flouring-mill shown in the accompanying engravings. The short system has been productive of a vast deal of thoughtful study and planning on the part of mill-builders. The time when the cost of a plant was a secondary consideration passed away long ago. In fact, the short system was thought out for the simple and sufficient reason that something had to be done for the millers who had small mills on their hands that had to be remodeled or else be closed, or wished to build a mill in a locality where the trade would not warrant a large mill. The demand was for some effectual plan to meet the necessities of millers thus situated, at a cost which would not be prohibitive. Consequently the short system was evolved, and since it proved a success mill-builders have endeavored to provide an effective



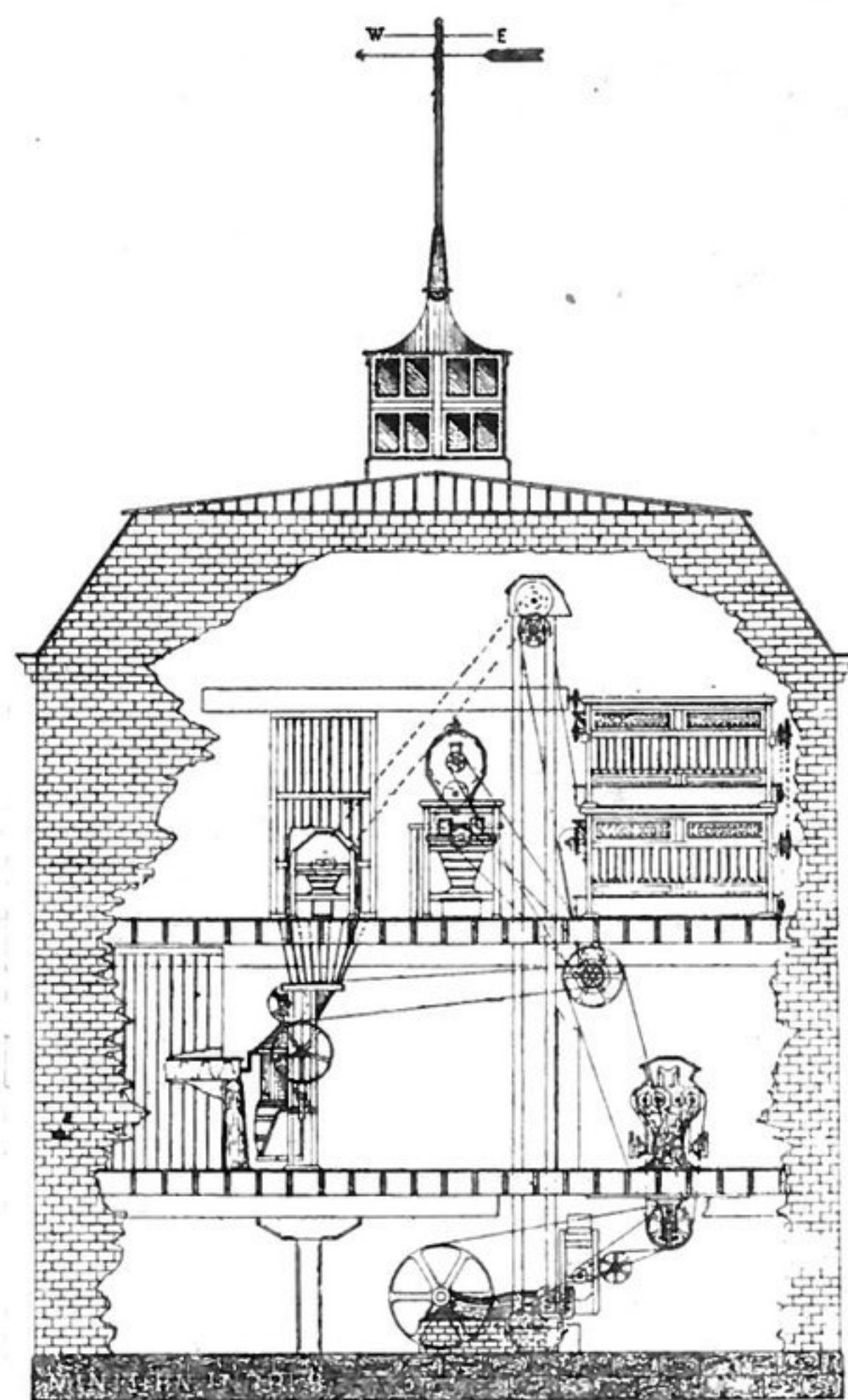
SECTIONAL SIDE PLAN.



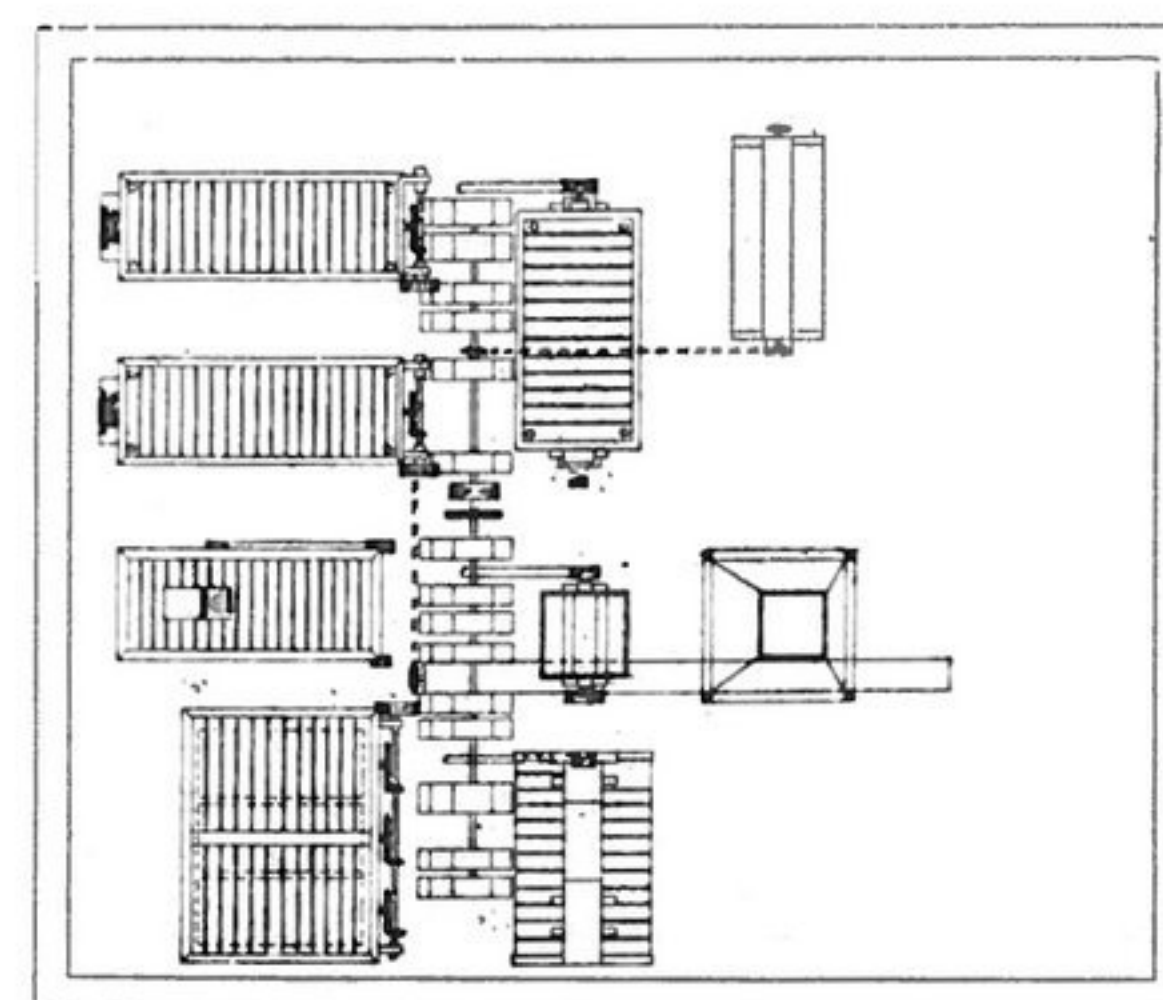
PLAN OF BASEMENT.

plant at as small a cost as possible. The plants and arrangement shown herewith are those of a short-system mill built by the well-known J. B. Allfree Company, of Indianapolis, Ind. Its capacity is from 50 to 60 barrels a day, and the entire outfit is furnished at a very reasonable price, in fact at a price that would surprise many millers. The machinery may easily be placed in a floor space of 35 by 30 feet, not taking the engine and boiler room into account. When the mill is planned new, from the ground up, it contemplates a building of the size just named, with two stories, basement and attic. The basement is 8 feet high and each of the stories 11 feet. In the basement are the power connections, the pulleys for driving the rolls, the elevator-boots, etc. On the grinding floor are the rolls and packer, and on the bolting floor the reels, purifier, cleaner, etc. In the attic are the elevator heads, etc. The machinery provided for in

this plan embraces the Keystone Roller Mills, the Allfree Centrifugals, Allfree Scalpers, "Success" Bolters, Allfree Purifier, Climax Bran Duster and the Allfree Flour Packer. All these machines have been made perfectly familiar to our readers by illustrated articles in recent issues of THE MILLING WORLD. This is a short-system, not on paper alone, but in actual and successful operation in a large number of mills. Millers who are about to build or rebuild, and who desire to secure thoroughly satisfactory mills of moderate capacity, will do well to correspond with the J. B. Allfree Company, who build mills of all sizes as well as a complete line of first-class mill machinery. All desired information about the mill illustrated herewith may be obtained by correspondence. The Allfree complete outfits are giving thorough satisfaction wherever employed. No miller who is about to build or rebuild can afford to ignore the claims of this company to consideration. Their mills are scientific and practical em-



SECTIONAL END PLAN.



PLAN OF BOLTING FLOOR.

bodiments of correct principles and wide experience, and the millers who desire to get the most efficient outfits for the least money should study their plans and write to them for full particulars.

MAKING OIL FROM CORN.

According to recent reports arrangements are being made for the manufacture of corn oil in this country. It appears that the possibility of getting the oil from corn in a way suited to special purposes was thought of first about three years ago, since which time the uses of the oil have grown in a slight degree. In the manufacture of starch and hominy the corn germs are thrown out. This refuse has been largely used for feeding purposes. It is now proposed to put up a factory in Brooklyn to take the germs and bring out larger quantities of the oil product. A company has been organized, and work will be prosecuted vigorously. The claim made for the oil is that, as all the white zinc or

lead ground in linseed oil turns after a time a yellowish color, the admixture of this corn oil will keep the color perfectly white.

ELECTRIC WELDING OF METALS.

"The Locomotive."

Our illustrations show one of the most remarkable results arising from the recent development in and application of electricity. Its influence upon the working of metals will be so great that it is difficult at the present time to comprehend



FIG. 1.

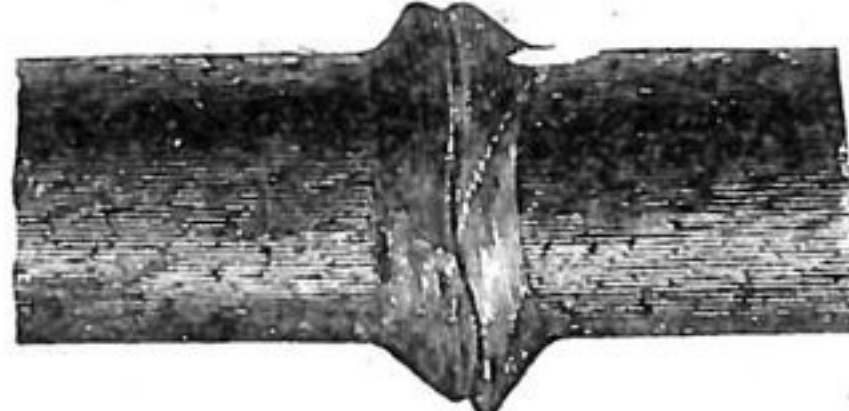


FIG. 2.

it. We refer to the electric welding of metals by the process invented by Prof. Elihu Thompson, of the Thompson-Houston Electric Company. Hitherto welding has been confined to wrought iron and steel, and the most perfect welds had about seventy-five per cent. at their best of the strength of the solid bar. Other metals than these could not be welded by any means whatever. The process of welding iron by the blacksmith is at the best crude and imperfect. Now all this seems destined to be suddenly changed in all industrial works. Not only iron is perfectly welded in a very short period of time, but all kinds of metals can be welded with equal facility not only to each other but to any



FIG. 3.

other kind of metal. Moreover the line of junction of the welded pieces, in the case of iron at least, is stronger for an equal sectional area than the original bar, this being due apparently to the fact that the fusion of the metal by the electric current eliminates the cinder present in all wrought-iron bar, so that the line of junction of the welded surfaces is more homogeneous and consequently stronger than the original section of the bar. The principle involved in this new art is that of causing currents of electricity to pass through the abutting ends of the pieces of metal which are to be welded, thereby generating heat at the point of contact, which becomes the point of greatest resistance, while at the same time mechanical pressure is applied to force the parts together. As the currents heat the metals at their



FIG. 4.

points of junction to the welding temperature, the pressure follows up the softening surface until a complete union or weld is effected, and as the heat is first developed in the interior of the parts that are to be welded, the interior of the joint is as efficiently united as the visible exterior. This is the weak point about an ordinary weld, as may be seen by reference to the accompanying figures. Figure 1 shows full size a piece of half-inch iron welded by electricity, the electrotypes being made directly from the specimen, which was filed down to the center line to obtain a section through the center, and then etched with acid, the engraver's services not being brought into requisition at all. The difference between the character of the weld and that done at the ordinary forge is well shown by comparing Fig. 1 with Figs. 3, 4, 5 and 6, which show ordinary welds, the

electrotypes being made in the same manner as in the case of Fig. 1, and first appeared in the *Locomotive* in April, 1884, the object being at that time to show the imperfections of the ordinary weld, 5 and 6 showing the result when the attempt was made to weld iron and steel together. We regret that we have no specimen of iron and steel electrically welded, but the welds of dissimilar metals by the electrical process are, we are informed, just as perfect as between two pieces of iron. Fig. 2 shows the external appearance of the electrically welded bar; it shows the up-



FIG. 5.

setting of the ends of the bars as they are brought together. Removing this projecting portion with a file or in the lathe so that the bar has a uniform diameter, and pulling apart in a testing-machine, the break nearly always takes place outside of the weld. The machines built by the Thompson Electric Welding Company are generators of electricity so constructed as to produce in the most economical manner the low-pressure currents needed to do the work. They are of sizes and types suited to the kind of work to be done.



FIG. 6.

They are built to be driven by a belt in shops where there is no dynamo used; where a dynamo is used for any purpose whatever its current can be used for welding by utilizing it in a properly designed machine of what is called the indirect type. The amount of power required to do this welding is used for so short a time that its cost is really nothing, a few seconds only being required to weld the largest bars. Twenty-horse-power is the amount actually consumed in welding a half-inch bar, as shown in our cuts, the actual

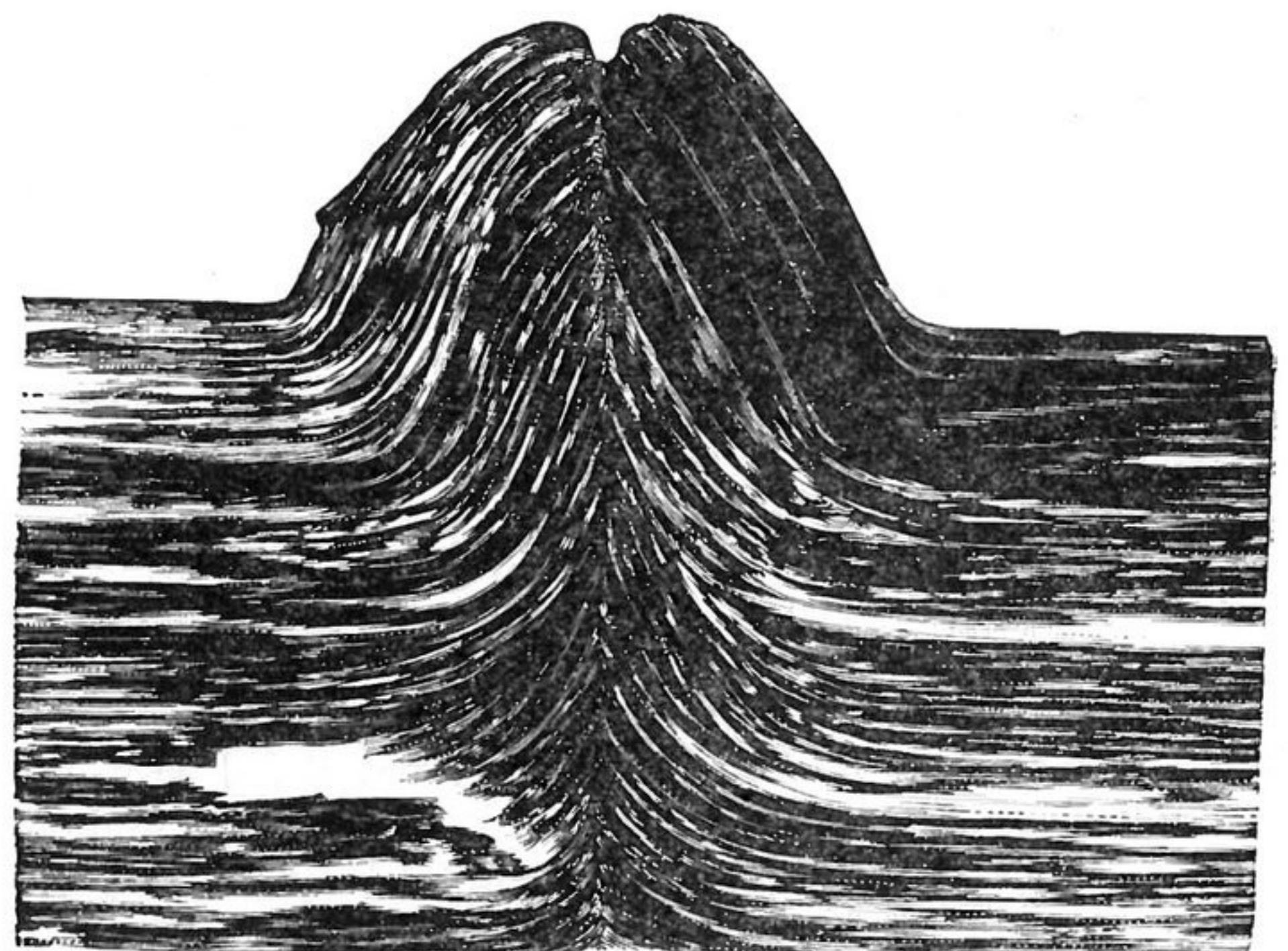


FIG. 7.

time consumed in welding being not over three or four seconds, as was witnessed by the writer recently. In Fig. 7 an attempt has been made to show on an enlarged scale the section in Fig. 1. This is a difficult matter to do; but under a power of about 40 to 50 diameters on a compound microscope the denser and more homogeneous structure of the iron through the line of the weld is beautifully shown. With an ordinary weld the microscope is not as a rule needed to show actual separation of the surfaces supposed to be welded.

POINTS IN MILLING.

SAID an old miller to the writer not long ago: "The weather has a great deal to do with the mill, the miller, the grain, the flour and the machines. For instance, to-day my mill is running perfectly. Every thing seems to go all right. Yesterday it was right the other way. The rolls acted crazy, the stock pasted everywhere, and bran and flour seemed to be determined to stay together to the end of the chapter. The fires burned badly, the steam seemed to be lifeless, and I was discouraged. The old mill seemed to be bent on turning out graham and hog-feed where I was aiming at something else. What was the matter? Well, I can't say exactly, but the weather yesterday was bad. It was neither cold nor warm. To-day it is cold and clear, and you can see how the mill works. Look at this stuff in this bin. It is bad in color and altogether unsatisfactory. It seems dead. Now look at this, made of the same grade of grain and on the same machines to-day. You would never be able to believe that both came from the same mill, let alone from the same grain and on the same machines. I can't explain it. Can you? Write it down in black and white that the weather makes the miller."

ACCORDING to a high Hungarian authority on milling, the roller mills of that country grind from 270 to 520 pounds of wheat per indicated horse-power for every 24 hours, while the buhr-mills grind only 315 pounds at the most. These figures show that some of the Hungarian roller mills must be badly equipped or badly managed. Where they fall below buhr-mills by 14 or 15 per cent. with the same power, something must be wrong. Probably many American roller mills are suffering from the same cause. If the machines are badly designed, or badly constructed, or badly handled, there is sure to be a wastage in the important matter of power, and that wastage generally may measure the difference between successful and un-successful mills, between properly equipped and improperly equipped mills.

PRACTICAL millers may justly complain of the attitude of the various conventions of millers, so numerous in these days. Not one of these conventions has thought it worth while to pay the least attention to flour-making as an art. All their attention is given to flour-selling. Let an old dusty suggest that the making is often the cause of the trouble in the selling of flour, and that much of value might be learned in these conventions if practical matters were not entirely ignored and financial matters only treated. In every convention there are millers who are prosperous, whose flour finds ready sale at top prices, and whose bank accounts are steadily growing. Alongside are millers who are doing just as much business, but who complain that they make little or nothing. Divide a convention into two classes on this basis, and then let the prosperous ones tell how they make their flour. In that way one important point, now wholly disregarded, would be properly presented and much of the present difficulty would be avoided.

"CAPACITY" is a wonderfully elastic word as applied to flouring-mills. Practically it means next to nothing. It may mean almost any desired thing. For instance, at a recent convention of millers one mill was listed at a "capacity" of 600 barrels daily. That mill has never ground 300 barrels in a day, and it never could. Its "capacity" in theory is twice its "capacity" in practice. What effect has the theoretical upon the practical "capacity" of that mill? None, of course, but upon the market conditions it may have a decided effect. The mill is rated at 600 barrels and has to work steadily to grind 300 barrels. The owner signs an agreement to restrict output 50 per cent. Counting on his "600-barrel capacity" he is allowed to grind 300 barrels daily. What happens? He goes right on grinding just as much as he did before the agreement to restrict was made. If other mills on that list were rated as his was, they would all go right on turning out just as much flour as they did before the agreement. What would follow? The markets would remain glutted, stocks would increase in-

stead of diminish, and a new "mystery" would be added to the situation. And "all on account of capacity"! How much of this would be revealed in a close investigation of affairs since the last convention of millers? How many mills would prove to be accurately rated? How many mills would be found actually grinding only half of what they can grind? Doubtless some very interesting facts would be revealed by investigation, but, as the conventions have not the power to investigate, the managers must depend upon the representations made to them. The only real way to reduce output is to ignore the "capacity" basis and agree upon a regular old-fashioned shut-down for a given time. In that way only can the reduction of stocks be assured.

DECIDE what grade of flour you will make, and then equip your mill to meet the requirements of that grade. Don't start out to make one grade of flour and then equip for some other grade.

INVENTIONS in milling machinery do not offer any startling innovations nowadays. The past year has brought out no "revolutionizer," unless the Haggenmacher rotary dresser may be called one. If it is so meritorious as its inventors and owners claim, it is remarkable that so little is heard of it.

Now and then I come across a milling-machine that sports a number of useless parts, the only function of which is to crowd the machine out of the market by increasing the cost of making. A machine laden with costly useless parts may be considered to mean that the manufacturers of it are going to seed.

NIAGARA TO BE HARNESSSED.

Niagara is to be "harnessed." A Chicago man has settled the question. The Chicago "Evening Journal" of January 30, 1889, says: The problem of how to utilize the water power of Niagara river for manufacturing and other purposes is in a fair way of being solved by a Chicago man. Practical engineers have declared the project feasible, and plans have been formulated with the object of undertaking the work. C. M. Bartlett, an engineer and contractor of this city, has been for some time engaged upon the preparatory work, and the results of his labors have not only received the approval of capitalists, but are protected by letters patent issued by the Government last month. During the current week application will be made to the New York Legislature for the necessary authority to undertake the work. The application is indorsed by prominent citizens of Chicago, and it is not thought there will be any difficulty in securing the legislation desired. The bed of Niagara river at the foot of the falls is said to be 100 feet from the bed at the brink of the cataract. Mr. Bartlett proposes first to tunnel a series of tail-races from the river bed at the foot of the falls a distance of from 200 to 600 feet up the river, on either the American or Canadian side. These completed, he will commence excavating on a direct line to the upper bed of the river. When the work has reached a given point between the upper and lower beds, coffer-dams 100x600 feet in dimensions will be employed for the purpose of obtaining space in the former to continue the excavation from the upper bed of the river, and the same will be prosecuted until a junction is made with the excavation from below. This completed, heavy iron beams will be anchored in the solid stone wall composing the sides of the shaft, to prevent clogging by debris and ice caught in the river current in its course from Lake Erie. The same course of operations will be continued until a tunnel, so to speak, of a parallel width of forty-two feet has been excavated from the American to the Canadian shore. Ten feet below these girders a water-tight reservoir will be constructed of durable material, extending longitudinally from shore to shore. It will be forty feet in width and otherwise sufficient in size for the service. It will be supported in the center by the bottom of the excavation and securely held in place. Six feet below the reservoir the work-room of the hands will be built on another set of

girders, also mortised into the rocky sides of the passage. From the working floor a double row of iron pipes, five feet in diameter, will be located at a distance of sixteen feet apart throughout the entire length of the tunnel, extending from top to bottom. The interior of each will be equipped with a turbine wheel of the latest improved pattern, and each of the pipes will connect with the reservoir by means of ten-inch pipes, supplied with valves to regulate the flow of water. Dynamos to the number of 100 will be placed at the bottom of the shaft. By opening the valves a flow of water of incalculable force will pass through the 10-inch pipes into the 5-foot pipes, starting the turbine wheels, and the power thus applied to the dynamos is transmitted over wires to any given point within a radius of fifty miles, where it can be utilized as a very cheap substitute for steam or other motive agency. If the right of way is secured in New York and Canada, a company will be organized for the development of this invention, and the preliminary work upon the excavation will be commenced. The work, it is claimed, can be concluded and in operation within a year.

SUPREME COURT PATENT DECISIONS.

Letters Patent No. 197,314, granted to John J. Bate November 20, 1877, for the term of 17 years, did not expire with the term of the first Canadian patent obtained for 5 years, but continued in force till the end of the extended term of 15 years, to wit, January 9, 1892, said Canadian patent having never ceased to exist, but having been force continuously from January 9, 1877.

Where the Canadian statute under which the extensions of the Canadian patent were granted was in force when the United States patent was issued, and also when the patent was applied for, and where by the Canadian statute the extension of the patent for Canada was a matter entirely of right, at the option of the patentee, on his payment of a required fee, and where the 15 years' term of the Canadian patent has been continuous and without interruption, the United States patent does not expire before the end of the 15 years' duration of the Canadian patent.

The provisions of the act of 1870 and of the Revised Statutes mean that the United States patent shall not expire so long as the foreign patent continues to exist, not extending beyond 17 years from the date of the United States patent, but shall continue in force, though not longer than 17 years from its date, so long as the foreign patent continues to exist. Under section 4887, although the United States patent may on its face run for 17 years from its date, it is to be so limited by the courts, as a matter to be adjudicated on evidence in pais, as to expire at the same time with the foreign patent, not running in any case more than 17 years; but, subject to the latter limitation, it is to be in force as long as the foreign patent is in force.

While it may be proper, in a case where the date of a foreign patent issued prior to the granting of a United States patent to the same patentee for the same invention is made known to the Patent Office prior to the granting of the United States patent, to insert in that patent a statement of the limitation of its duration, in accordance with the duration of the foreign patent, it does not affect the validity of the United States patent if such limitation is not contained on its face.

Description of a process in an application for a machine patent does not constitute an abandonment or dedication to the public of such process, so as to estop the inventor from subsequently obtaining a patent for the process if applied for within two years from the date of the machine patent.

Where an element of a claim does not depend for its novelty in the material of which it is made it will be anticipated by a like element in a like instrument of different material.

A claim consisting of a number of elements which do not co-act to produce a new and useful result is a mere aggregation and not a patentable combination.

Where several old elements are so combined as to produce a better instrument than was formerly in use, but

each of the old elements does only what it formerly did in the instrument from which it was borrowed and in the old way, Held that the combination is not a patentable one.

MILLING PATENTS.

Among the patents granted February 12, 1889, are the following:

Wm. A. Holley and Ulrick Malin, Holland, Mich., No. 397,594, an electro-magnetic grain-scales.

Wm. H. H. Brunton, Elk City, Kans., No. 397,628, a grain weighing and registering machine.

August Heine, Silver Creek, N. Y., No. 397,720, a grain-scourer.

Chas. H. Marshall, Wood River, Neb., No. 397,737, a flour holder and sifter.

Christian Tangenberg, Grand Rapids, Mich., No. 397,760, a flour-bin.

Jabez Thomas, Darlington, Wis., No. 397,761, a flour-bolt.

Geo. Raymond and Albert Raymond, Chicago Ill., No. 397,818, a grinding-mill.

Jas. W. Terman, New Sharon, Ia., No. 397,879, a portable corn thrasher and separator.

SAYS a Canadian exchange: A new flour-mill is to be built during the coming summer at Port Arthur by Messrs. Hastings & McGaw, which will be among the best and most modern mills in Canada, if not the largest; it will be of brick and stone; of 500 barrels daily capacity; six stories high; an elevator of 40,000 bushels in connection; cost about \$75,000. They are to get a bonus of \$15,000 and exemption from taxation and agree to have the mill in running order by Oct. 15th.

DR. ALFREDO Nadal de Mariezcurrena, Barcelona, Spain, has started a monthly milling paper called "La Molineria Espanola," which may be freely translated "The Spanish Miller."

A RECENT report from Philadelphia says that the Baltimore and Ohio railroad will soon build in that city a 1,000,000-bushels grain elevator with suitable wharves.

SPECIAL NOTICES.

LIBERAL OFFER.

With a view of increasing our subscription list, we will send a copy of R. J. Abernathy's new book, "The True Short System" (Price \$2.00) and "The Milling World" for one year at the very low price of Two Dollars. Renewal will be treated same way. This offer will only continue for a limited time. Now is your chance. Send in your subscriptions at once.

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STEEL PAVING OF THE FUTURE.—As a substitute for granite blocks, steel paving is attracting considerable attention, its durability being said to be quite a point in its favor and its cost being somewhat less. It consists of steel strips about $2\frac{1}{2}$ inches wide and 1 inch thick, rolled with a channel on the side exposed to traffic, and with notches about 6 inches apart. These strips weigh eleven pounds to the yard and are laid across the street a distance of about five inches between centers, and their length is only sufficient to extend to the middle of the street, so that the proper slope from the center to the gutters can be secured. They are bolted together, so as to insure them against lateral slipping, and are fastened to wooden sills. A firmly constructed bed of gravel composes the support for this pavement, while between the steel strips a mixture of pitch and cement is poured, filling the interstices to a level with the tops of the strips and rendering the surface comparatively smooth.

GENERAL NOTES.

THE Indian reservations in 1886 in the United States amounted to 212,466 square miles, all that is left to the race of 3,250,000 square miles, once all their own. The total Indian population of the United States is 247,761. Estimated number of Indians in Alaska is 30,000. The Indian agencies are 61 in number. Number of Indian church members in

the United States is 28,663. Number of houses occupied by Indians is 21,232. Number of Indians living on and cultivating lands is 9,612. Number of Indians in the United States who wear citizen's dress is 81,621. Number of Indians in the United States who can read Indian languages is 10,027. Number of Indians in the United States who can read English is but 23,495. There are ten Indian training schools located in different parts of the Union.

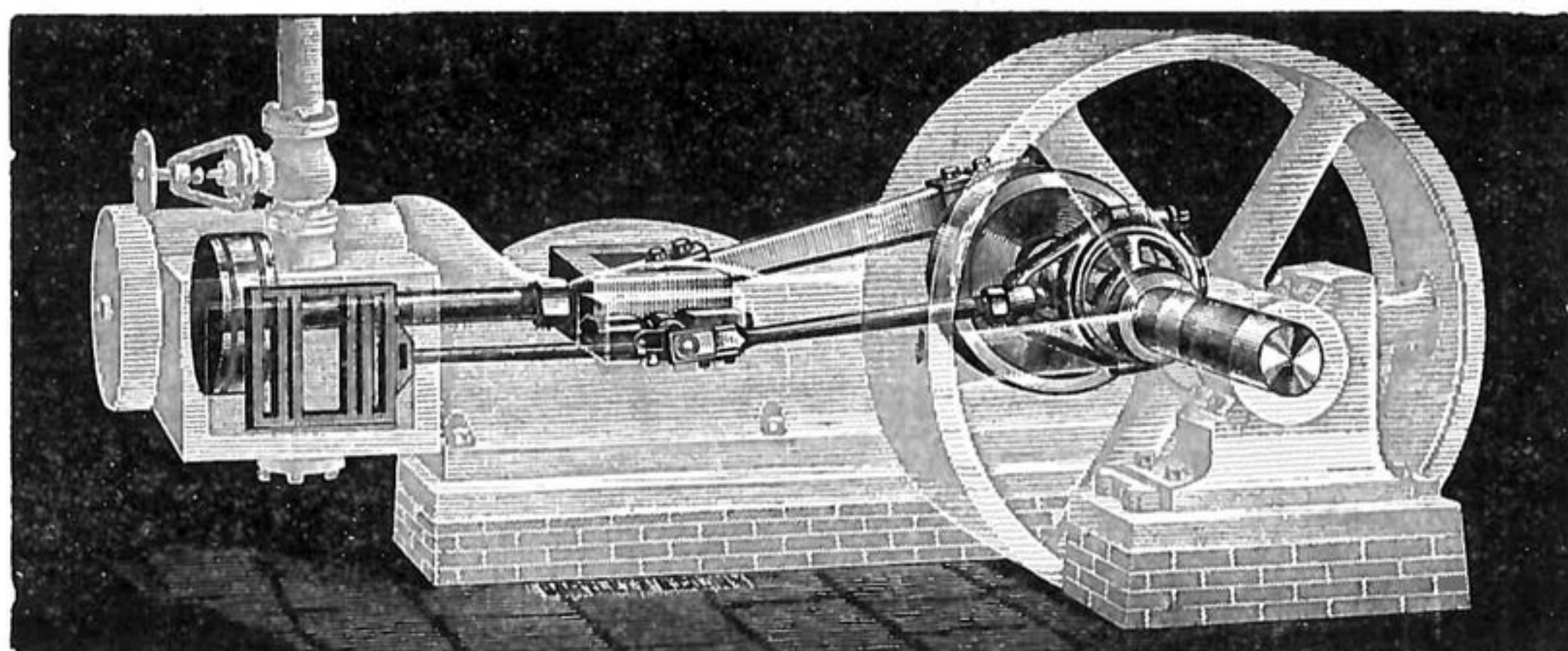
COTEMPORARY COMMENT.

That our city mills must lie idle considerable of the time between now and another harvest is a certainty. They would have to do it even if there were a profit in grinding, as there is not the wheat to keep them running. In spite of all that wheat is relatively too high here for any legitimate purpose, for there is an actual loss in putting it to any consumptive use.—*Minneapolis Market Record.*

The late bulge in wheat broke four large bucket-shops. No suspensions among these concerns occurred on the down turn.—*Chicago Daily Business.*

SAYS a St. Louis miller: "The recommendation to run half time by the Central Millers' Association is not generally understood and might mislead the general trade; it will do no harm to explain what it really means. The millers have a paper capacity and also an actual one. A miller can figure on paper that his mill has a capacity to make 1,000 barrels of flour a day, while his actual output would not be over 700 barrels. When he is limited to half time it means 500 barrels a day. You can, therefore, readily see how misleading this may be to parties who do not understand how to figure."

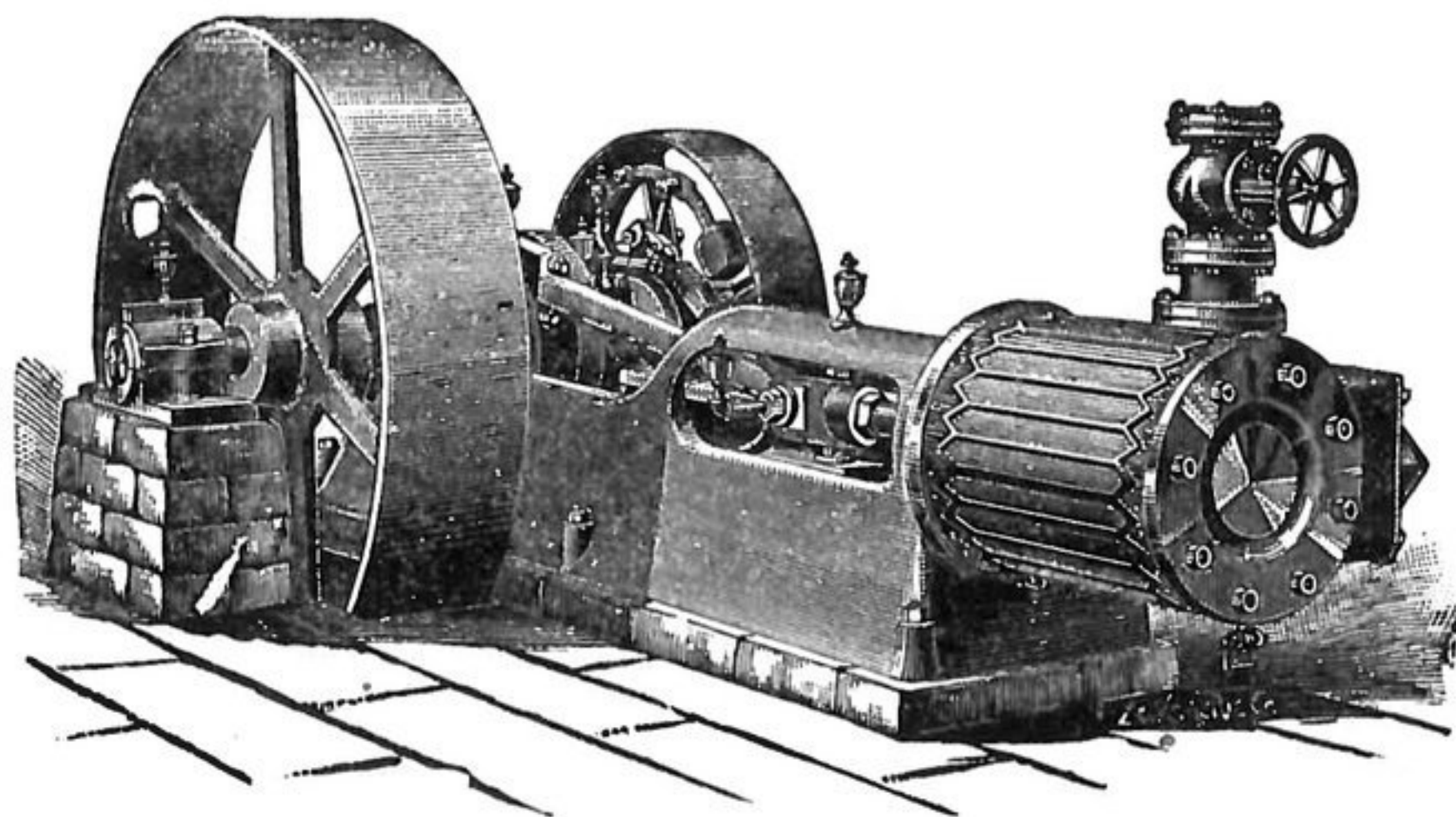
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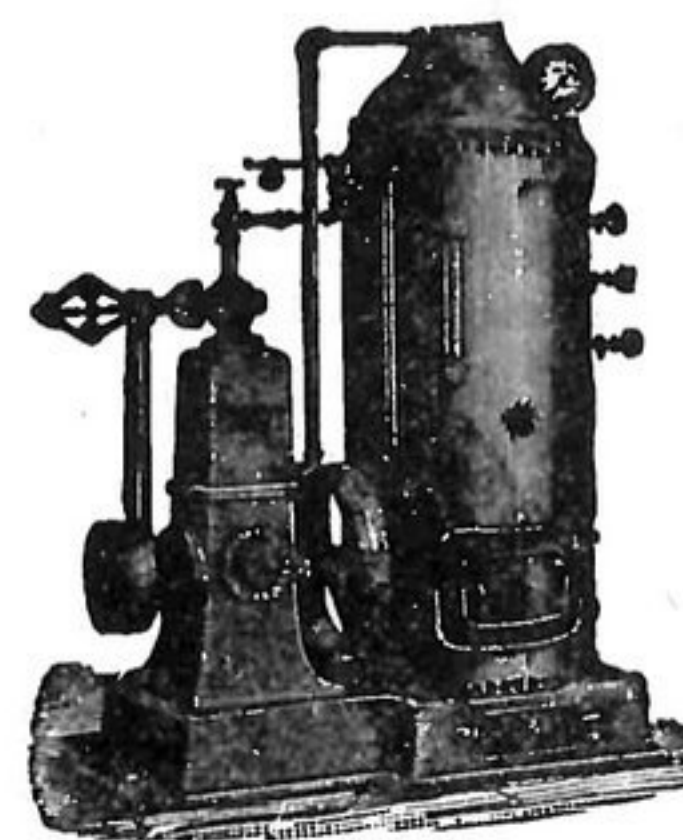


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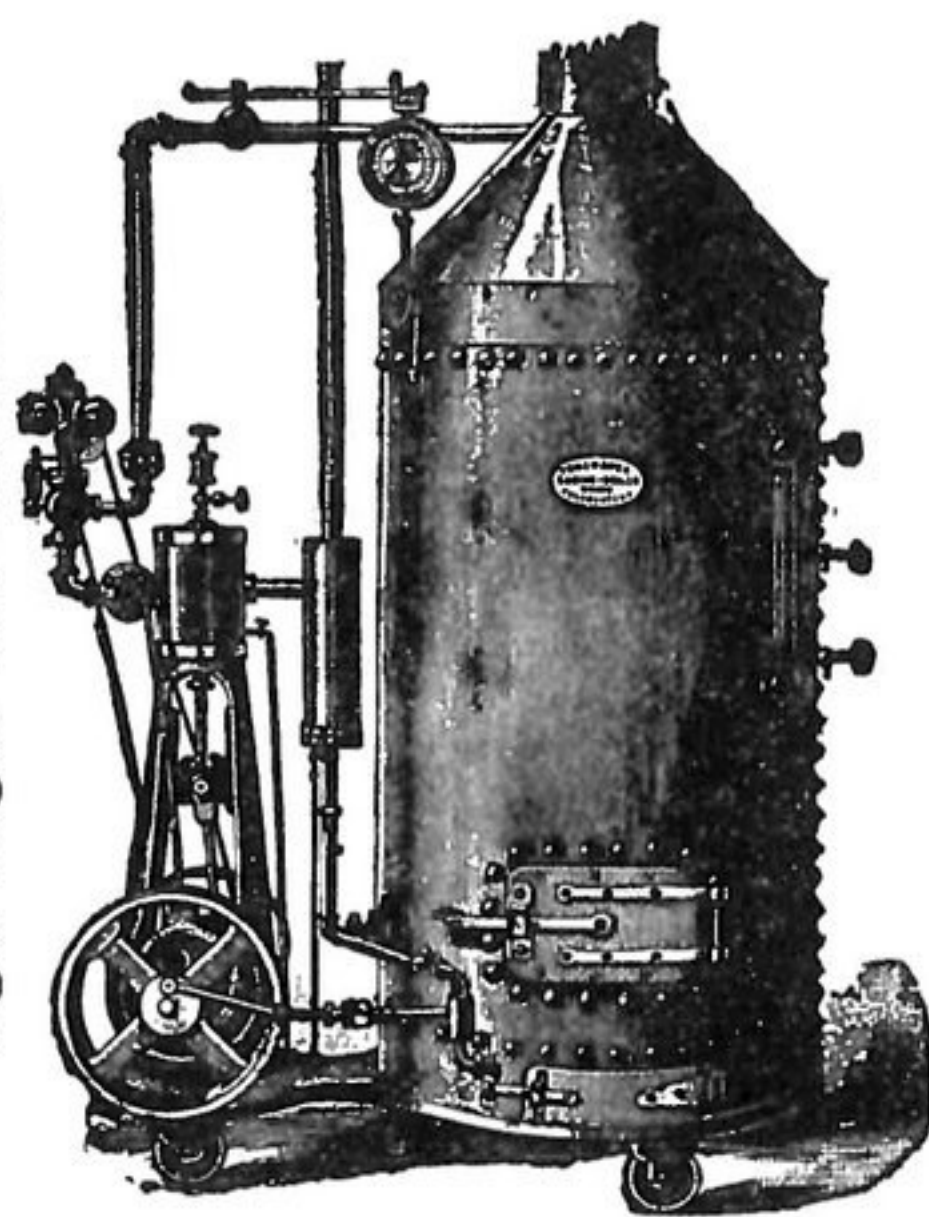
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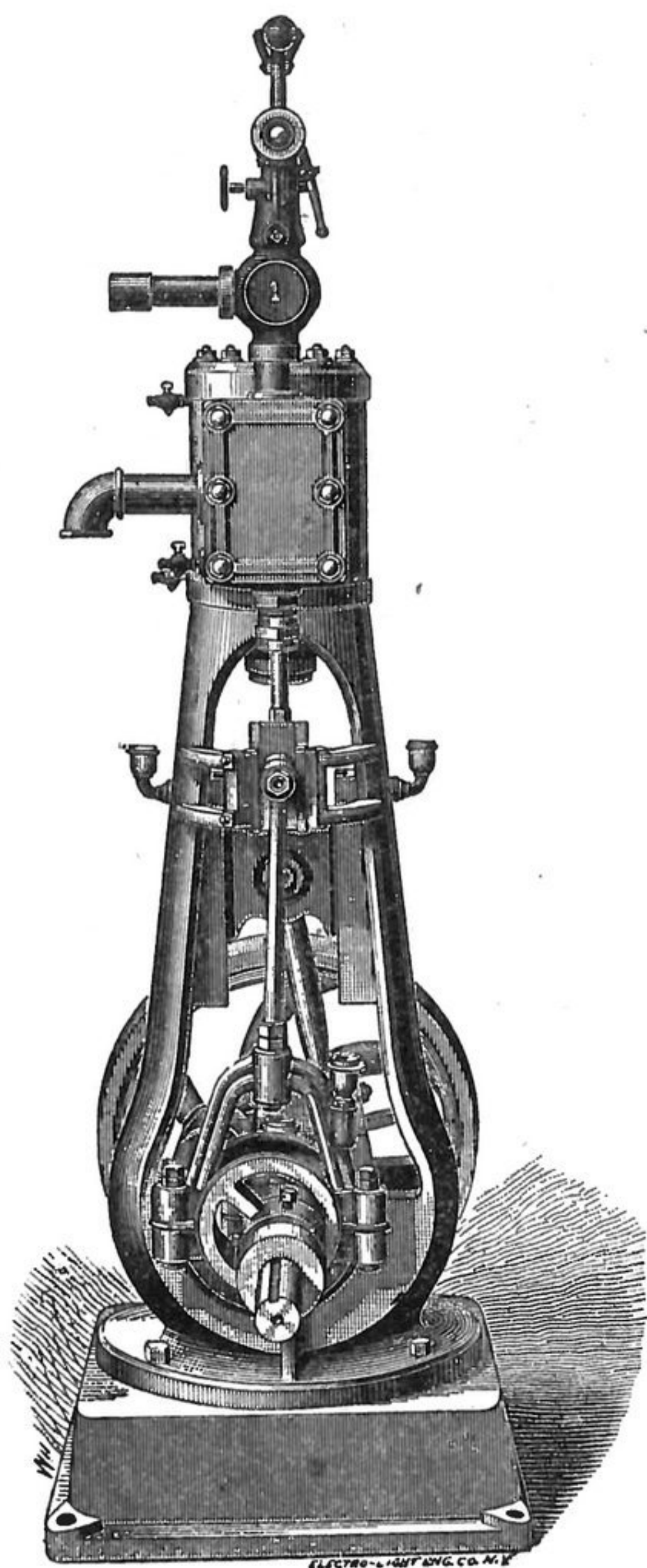
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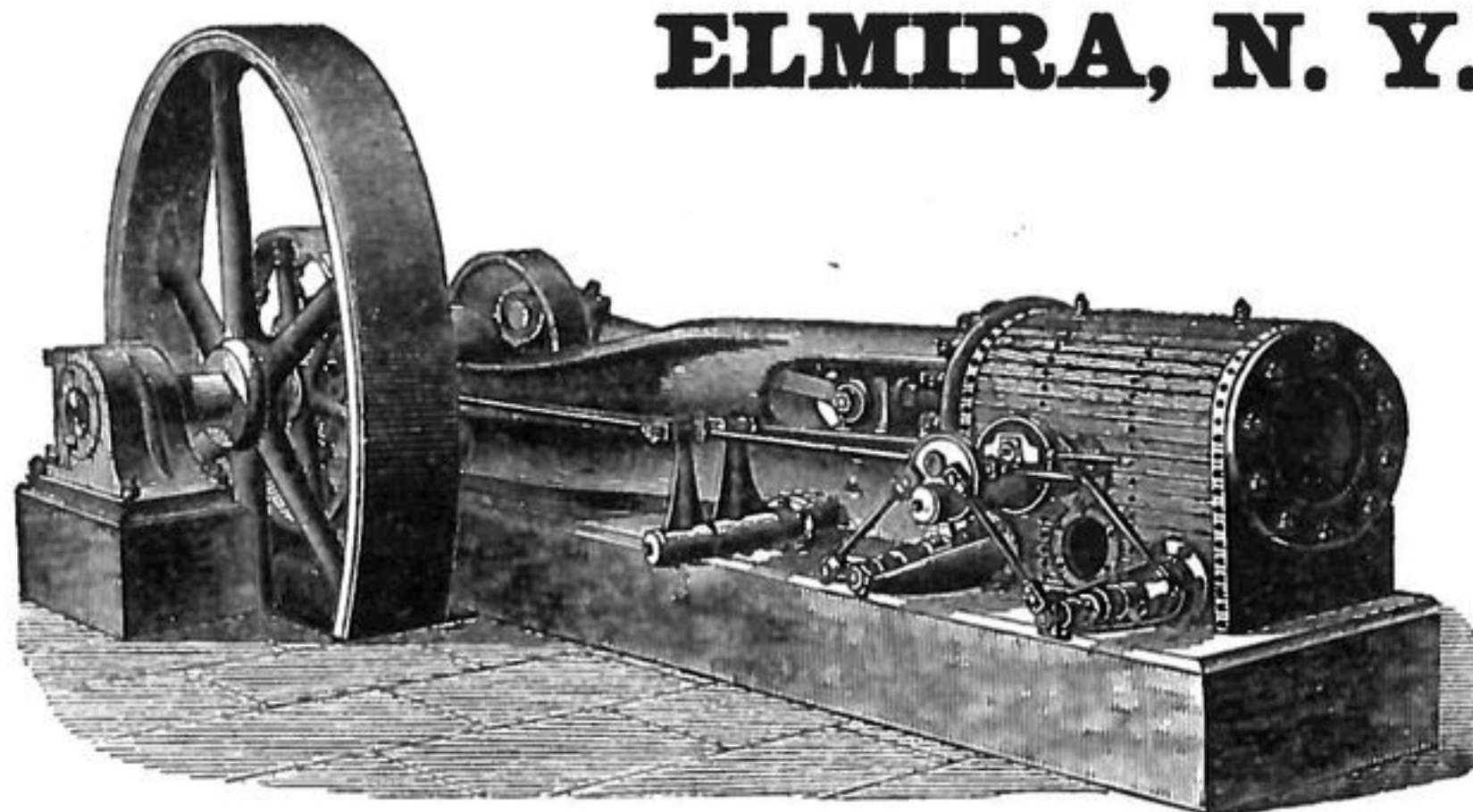
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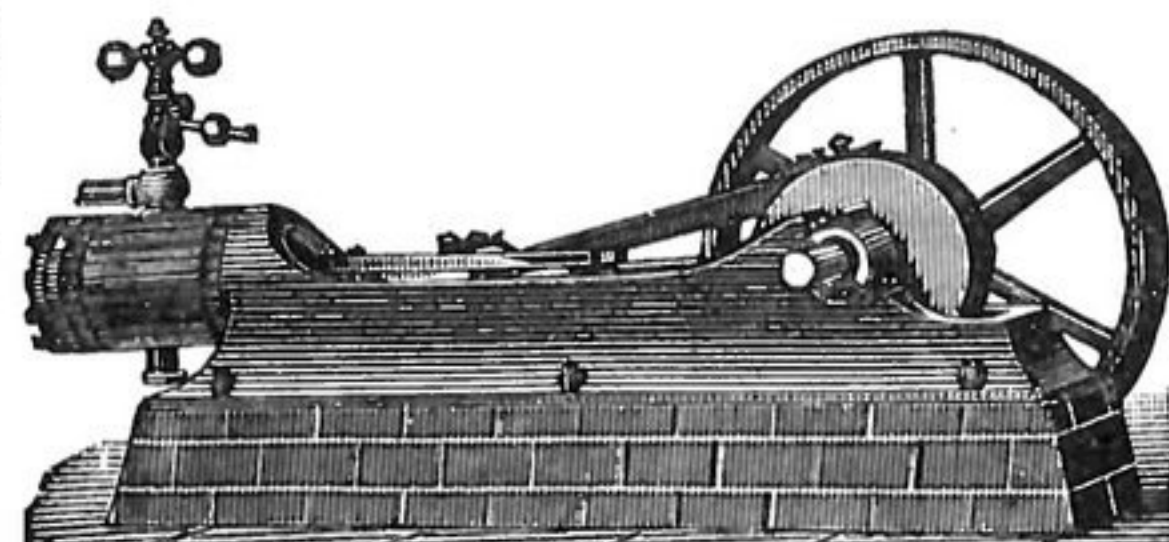
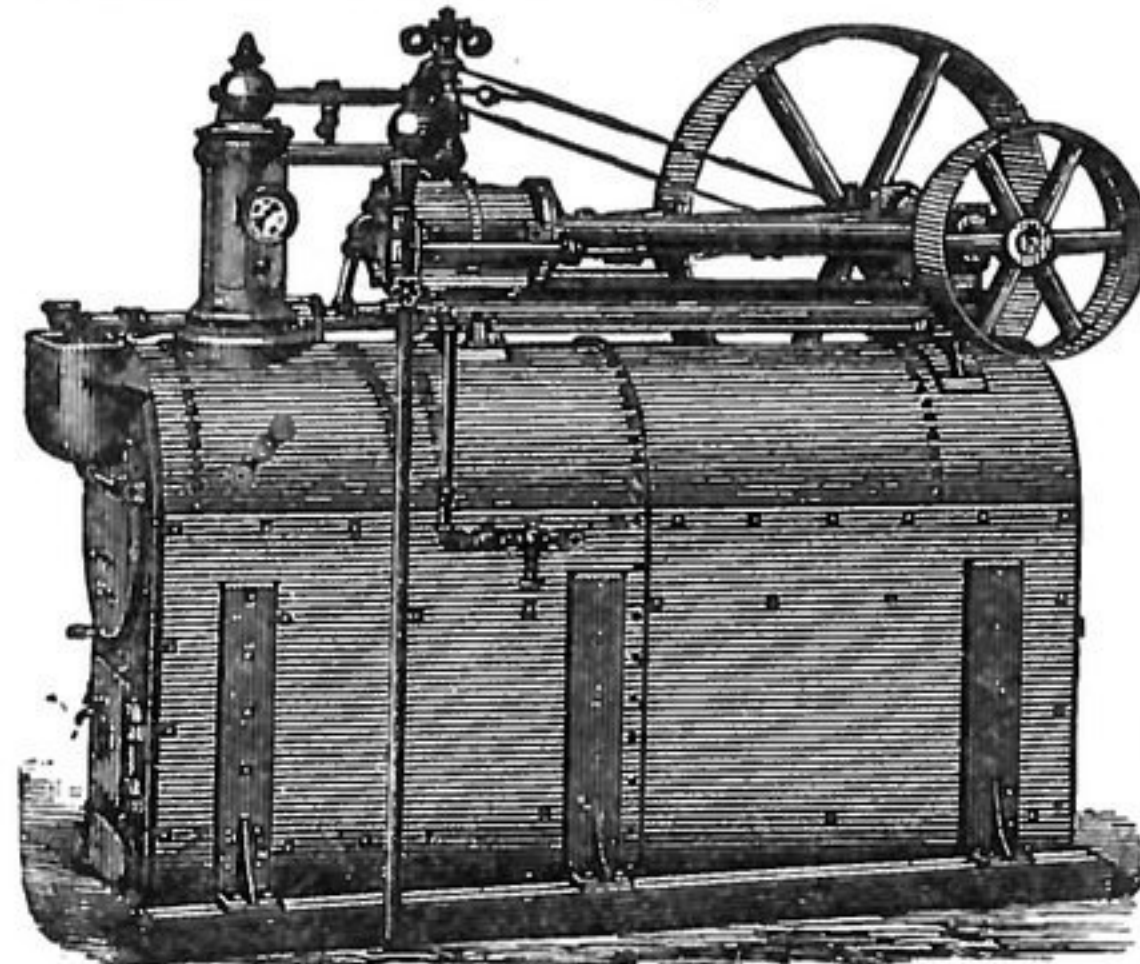
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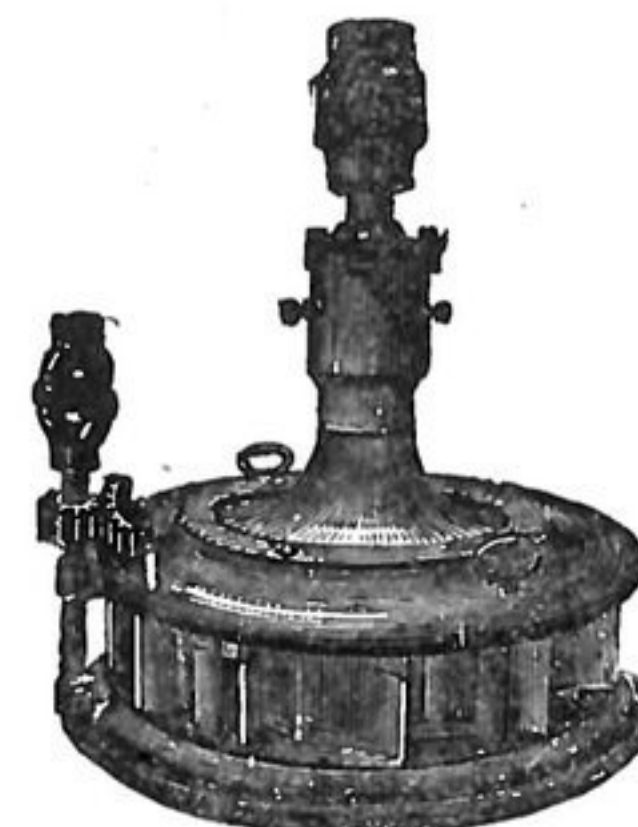
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The Franklin, Tenn., Flour Mill burned.
 Anniston, Ala., men will build a grist-mill.
 Amstutz & Co., millers, Sterling, O., assigned.
 D. Felix & Co., Adair's Creek, Tenn., added rolls.
 Faison Bros.' grist-mill, Mt. Olive, N. C., burned.
 H. P. Isaacs, miller, Walla Walla, Wash., sold out.
 J. Barclay, grist-mill, Springfield, Ont., foreclosed.
 W. S. Bumpus, Salineburg, Ky., builds a roller-mill.
 J. I. Triplett, Woodstock, Va., has built an elevator.
 Young & Ashley, Rockport, Ky., build a 65-barrel mill.
 J. E. Harrison, Swansborough, N. C., starts a grist-mill.
 N. Suplus' grist-mill, Williston, Pa., burned; loss \$4,000.
 Doplers & Moore, Proctor, W. Va., want roller machinery.
 H. F. & A. E. Rozier, Sparta, Ga., will build a roller mill.
 The Washington, D. C., Flour & Feed Co. add a roller corn-mill.
 Mrs. F. Lannott's flour-mill, Glen Falls, Md., burned; loss \$3,000.
 H. Lew's roller mill, Saukville, Mich., burned; loss \$18,000; well insured.
 The Bonsacks, Va., Flour Mill is remodeling to rolls with 75-barrel capacity.
 Egloff Bros., Valley Mills, Tex., add a 150-barrel corn-mill and new motive-power.
 Sanders Bros.' flour-mill, Wellsburg, W. Va., burned; loss \$6,000; they will rebuild.
 Geo. W. Dearborn, Amherst, Va., wants price-lists of machinery for a 50-barrel flour-mill.
 C. C. Beddoes, West Cliff, Colo., is putting in rolls furnished by the Case Mfg. Co., Columbus, Ohio.
 T. B. Coursey, Frederica, Del., is putting in rolls furnished by the Case Mfg. Co., Columbus, Ohio.
 The Star Milling Co.'s elevator, Staunton, Ill., burned; loss \$5,000; insurance \$2,100; fire incendiary.
 The Case Mfg. Co., Columbus, O., have an order for six pairs of rolls from E. Humphrey, Omega, Ohio.
 W. W. Forshee, Hiawasse College, Tenn., wants prices of grist and flour mill machinery for a new mill.
 Wm. Blair and others, Fort Smith, Ark., will build a \$20,000 flour-mill as soon as they secure a suitable site.
 W. F. Carter, Weatherford, Tex., will remodel to rolls, with 40-barrel capacity, in time for the next wheat crop.
 The Case Mfg. Co., Columbus, Ohio, have an order from J. Shrake & Son, Friendly, W. V., for 1 centrifugal reel.
 T. J. Lillard, Creston, N. C., wants information about roller machinery for a flour-mill which he is preparing to build.
 D. E. Haymie and others, Covington, Tenn., want a complete outfit of roller machinery for a new 80-barrel flour-mill.
 W. S. Bumpus, Salineburgh, Ky., has placed an order with the Case Mfg. Co., Columbus, Ohio, for four pairs of rolls.
 Kirk & Alexander, Winfield, Kan., have placed an order with the Case Mfg. Co., Columbus, Ohio, for two pairs of rolls.
 Borden Bros., New Vienna, Ohio, are making some improvements in their mill and putting in rolls furnished by the Case Mfg. Co., Columbus, Ohio.
 F. C. Scott & Co., New Waterford, Ohio, has placed an order with the Case Mfg. Co., Columbus, O., for 1 automatic feed, to be placed on his "Allis" rolls.
 The Case Mfg. Co., Columbus, Ohio, have the contract of Utz & Curtis, Topeka, Kan., for all the necessary machinery for a corn-meal mill on the Case system.
 The Case Mfg. Co., Columbus, Ohio, have an order from Courtright & Sargent, West Lafayette, Ohio, for six pairs of rolls, one centrifugal reel and other supplies.
 The Case Mfg. Co., Columbus, Ohio, have an order from Custer and McMichael, Hardin, Mo., for rolls, aspirators and purifiers for a short-system corn-meal mill.
 Gouldthrite & McCrea, Lee, Dak., are putting in additional rolls, scalpers, flour-dressers and other machinery furnished by the Case Mfg. Co., Columbus, Ohio.
 The Case Mfg. Co., Columbus, Ohio, are furnishing S. G. Darby, Vigo, Ohio, with the necessary rolls, aspirators and purifiers for a corn-meal mill on the Case short system.
 The Case Mfg. Co., Columbus, Ohio, are furnishing Porter & Son, Newton Falls, Ohio, the necessary rolls and other machinery for a full roller mill on the Case short system.
 J. S. Smith, Circleville, Ohio, is erecting a 100-barrel corn-meal mill and has placed his order for all the necessary rolls and other machinery with the Case Mfg. Co., Columbus, Ohio.
 The President has approved the act to enlarge the powers and duties of the Department of Agriculture and to create an executive department to be known as the Department of Agriculture. The Agricultural Bureau has been masquerading as a full-fledged department for many years, but hereafter it will have the right to put on airs.

H. Daily, of Jersey City, N. J., has placed an order with the Case Mfg. Co., Columbus, Ohio, for rolls and reels to be placed in his mill.

The Washington Flour and Feed Co., Washington, D. C., are putting in rolls, aspirators and purifiers for a corn-meal mill, the same being furnished by the Case Mfg. Co., Columbus, Ohio.

Frazier & Bowsher, Saxonsburg, Pa., have placed their order with the Case Mfg. Co., Columbus, Ohio, for all the necessary rolls and other machinery for a full roller mill on the Case System.

James Smith, New Milford, Ohio, is changing his buhr-mill to a full roller mill and has awarded his contract for all the necessary machinery and supplies to the Case Mfg. Co., Columbus, Ohio.

The Case Mfg. Co., Columbus, Ohio, have the contract of Kneidler Bros., Long Grove, Ill., for all the rolls, purifiers, flour-dressers and other machinery for a full roller mill on the Case short system.

Says Chicago *Daily Business*: Winter-wheat millers went home from the Indianapolis convention feeling bullish, and they have been putting in their time since buying all the cheap wheat they can lay their hands on.

Breadstuffs are imported into Mexico, though in the states of Puebla, Mexico, Michoacan, Gaudalajara, Aguascalientes, Guanajuata, Queretaro and Hidalgo there is an area of 200,000 square miles of superior wheat-growing land.

After giving the celebrated Case automatic feed a trial on their "Dawson" rolls, the Litchfield Milling Co., Litchfield, Ill., placed an order with the Case Mfg. Co., Columbus, Ohio, for 12 automatic feeds, to be placed on their "Allis" rolls.

E. Woods, Geneva, Ind., who lately placed an order with the Case Mfg. Co., Columbus, O., for the necessary rolls and other machinery for a full roller flour mill, has since placed an order with the same company for the necessary rolls, aspirators and purifiers for a short-system corn-meal mill.

The export movement of wheat and wheat flour from eight Atlantic ports from Aug. 25, 1888, to Jan. 26, 1889, was 8,473,627 bushels of wheat and 1,765,815 barrels of flour less than for the corresponding period in 1887-8. The decrease in flour and wheat together is equal to 16,417,545 bushels of wheat.

It is noted that Statistician Dodge of the Department of Agriculture in his December report places the Iowa corn crop of 1888 at 278,232,000 bushels; wheat 24,196,000 bushels; oats 67,090,000 bushels. On the other hand Secretary Shaffer of the Iowa State Agricultural Society gives the following figures based on returns from over 1,000 correspondents in all parts of the State: Corn 321,269,962 bushels; wheat 19,314,000 bushels; oats 78,681,814 bushels.

An Oregon paper says that there is still a good deal of wheat in the Willamette valley, the amount being estimated at from 30 to 40 per cent. of the crop. Those who hold it will not sell at present prices, and for the week ended Feb. 1 not a pound of valley wheat arrived in Portland, though some 40,160 centals of eastern were received. As shippers and millers can not pay what the holders want, no wheat is going out of the country and millers are thinking seriously of shutting down.

Says the *Minneapolis Market Record*, the leading authority in Minnesota on all grain matters: The generally accepted estimate of wheat in farmers' hands in Minnesota and Dakota is 6,000,000 bushels, good and poor. There are 7,241,000 bushels in country elevators. That is supposed to be the total supply left, above bread and seed. That 13,241,000 bushels is a little more than 5,000,000 bushels less than came to Minneapolis alone last year between February 1 and September 1. Stocks will not keep the mills running half time from now until September, and, with conditions existing, prices promise to be relatively very stiff during the next seven months, compared with those in other places.

BOOKS AND PAMPHLETS.

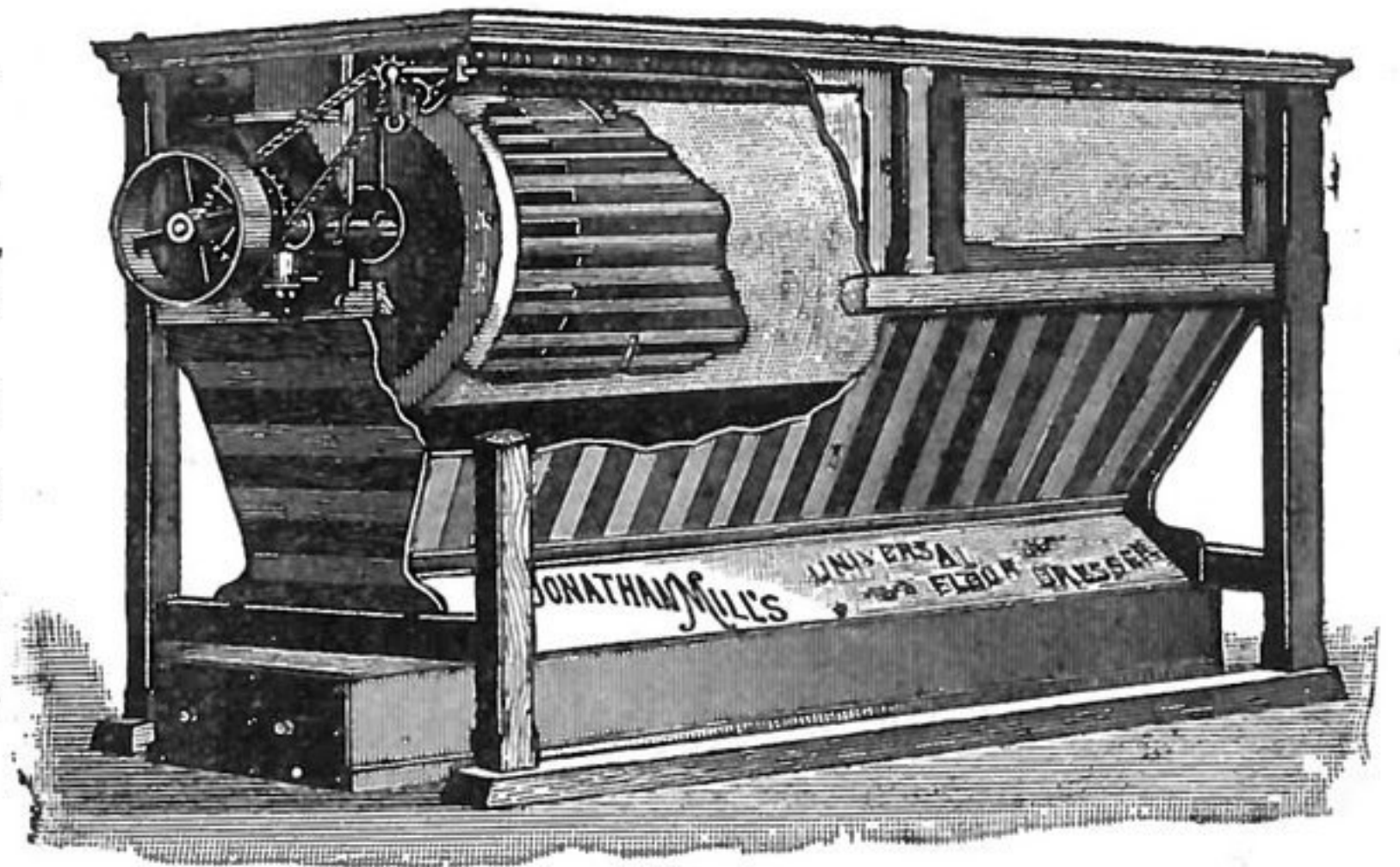
We have received from Edw. P. Allis & Co., Milwaukee, Wis., a copy of their neat wall calendar for 1889. It shows some of the famous large mills built by the company, and it is in every way neat and artistic.

No. 99 of *Good Housekeeping*, February 16, has a paper by Lieut. Frederick Schwatka on "Hyperborean Housekeeping." An article by Anna Griscom on "Lace Curtains" describes the proper way to wash and "do them up" at home. Aunt Rachel Macy in her fourth letter on "Quaker Housekeeping" branches off upon bed and table linen, towels, etc. Dr. Amelia A. Whitfield's excellent practical papers on the care of babies sustain their high value, and Chapter IX in this issue, on "Lung Troubles," is one of the best. An equally valuable paper is that by Dr. David N. Patterson on "The Feet in winter." An anonymous writer enters a plea for the usefulness of "A Man in the Kitchen." There are three excellent papers on topics relating to the "bringing-up" of children, one by Jane Ellis Joy on "A Houseful of Girls and One Boy," one by Lavinia S. Goodwin on "Little Foxes," and one by L. Helena Crumett on "Children's Voices." In an "Ideal Parlor," Dora V. Stoddard talks in a thoroughly common-sense way about the furnishing and arrangement of a room that is alas too often a monument to the occupant's bad taste and poor judgment. Rebecca Hart tells about Okra and the methods of preparing it. Mrs. Edward A. Perpall writes very interestingly about "Living with John's Relatives," and Pamela McArthur Cole talks of "The History and poetry of Pins."

PERSONAL MENTION.

Editor H. M. Sweatland, of our esteemed New York cotemporary, *Power-Steam*, was among our visitors during the past week.

MILLERS of the United States and Canada write us for our new pamphlet and revised price list of our **Jonathan Mills UNIVERSAL FLOUR DRESSER**. The best machine on the market. Giving satisfaction everywhere in the best mills in this country. Thousands in use. We carry a full line of Crown Silk anchor Bolting Cloth and Grit Gauzes.

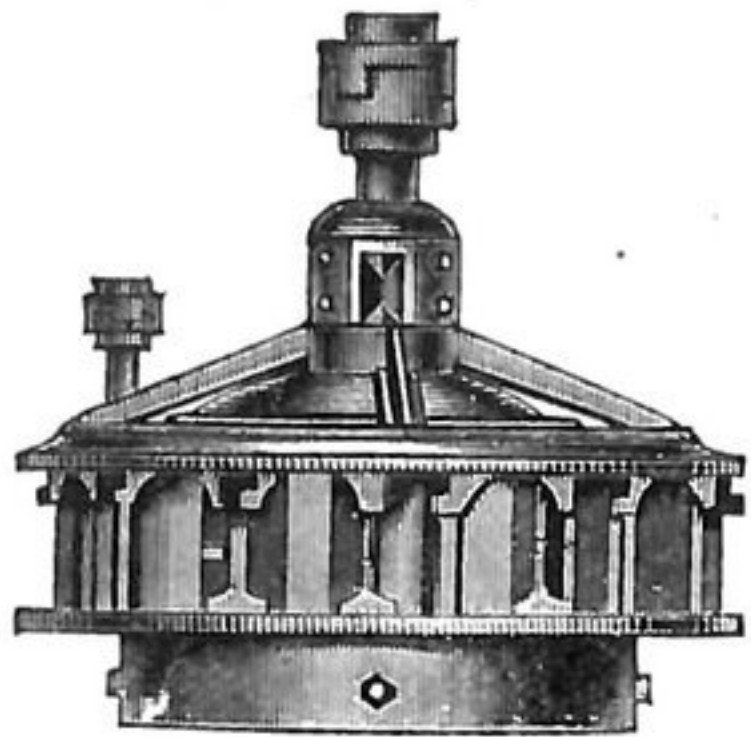


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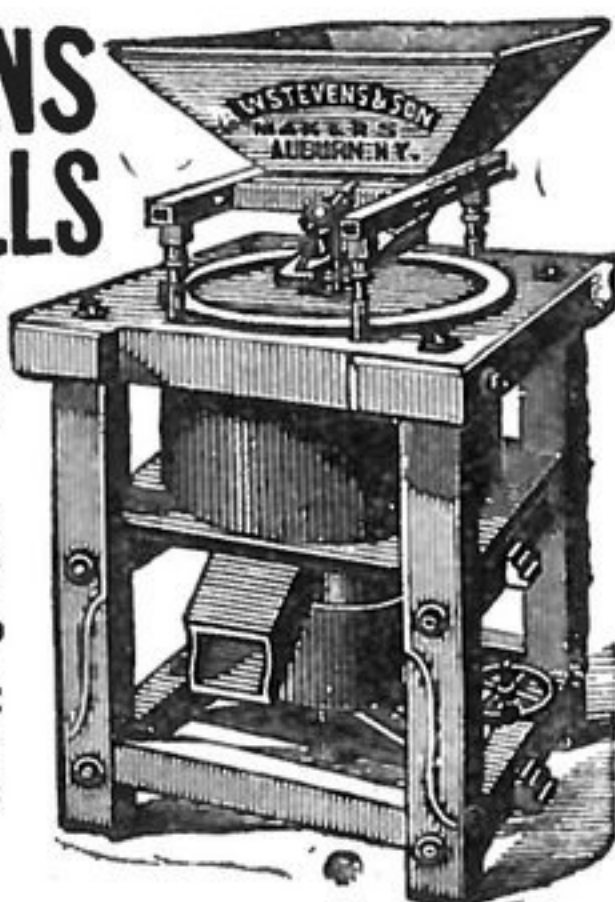
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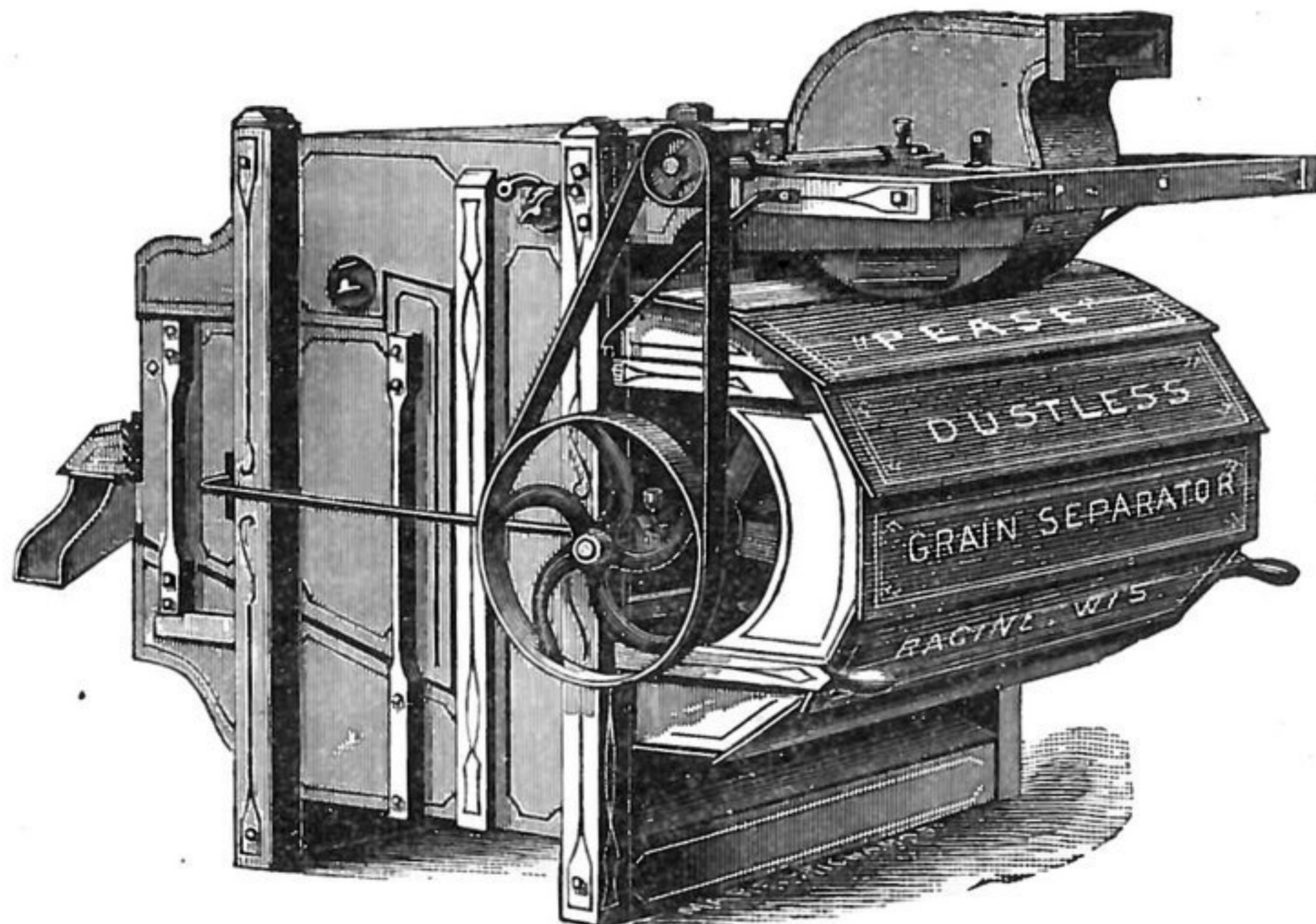
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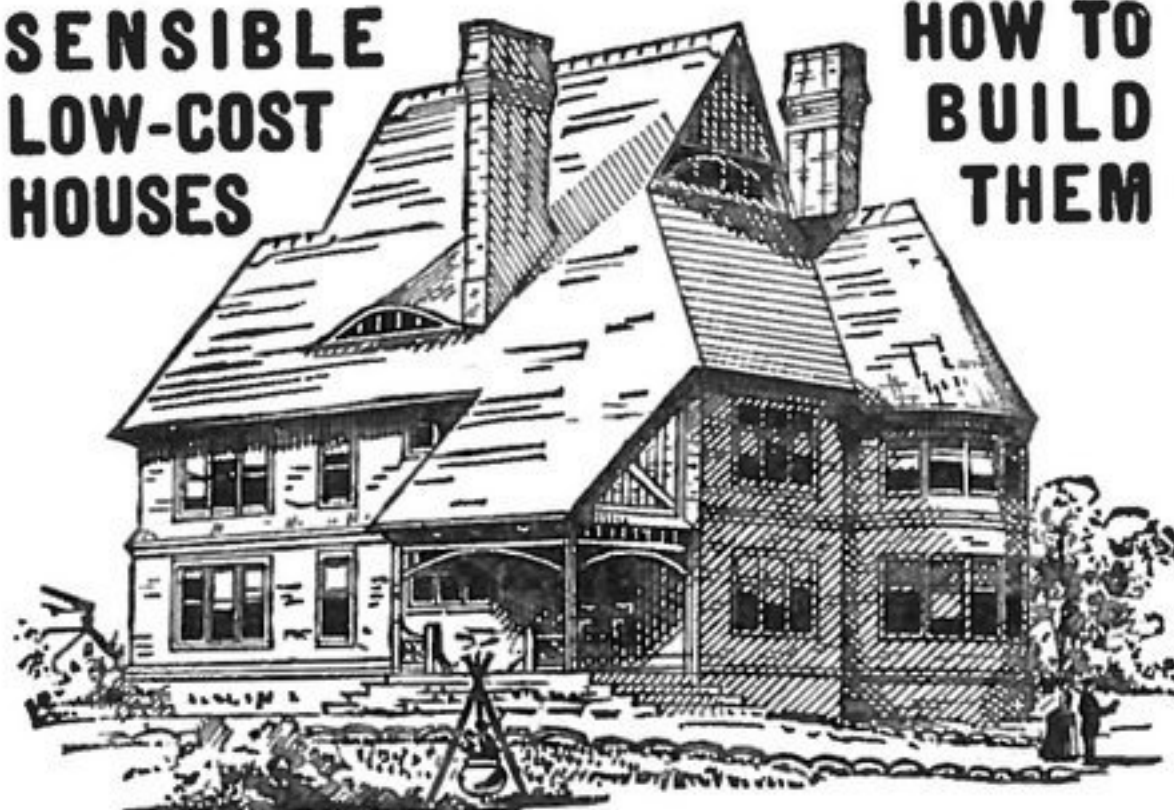
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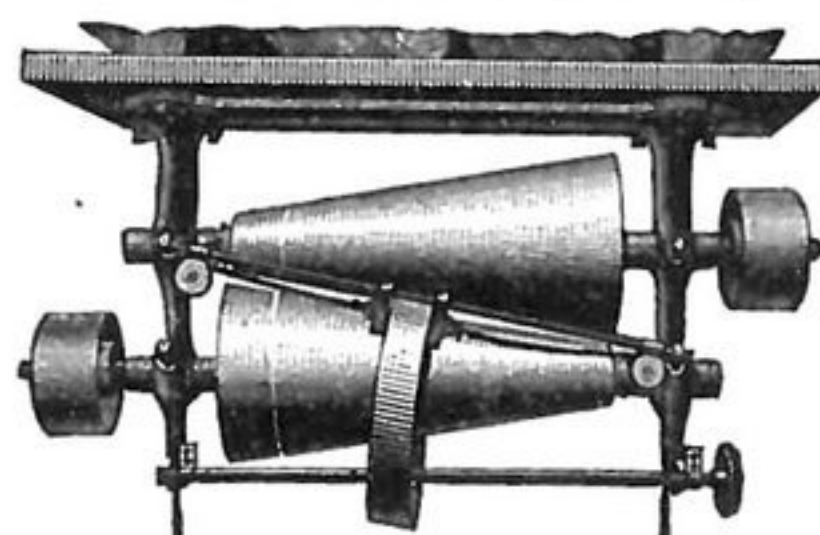
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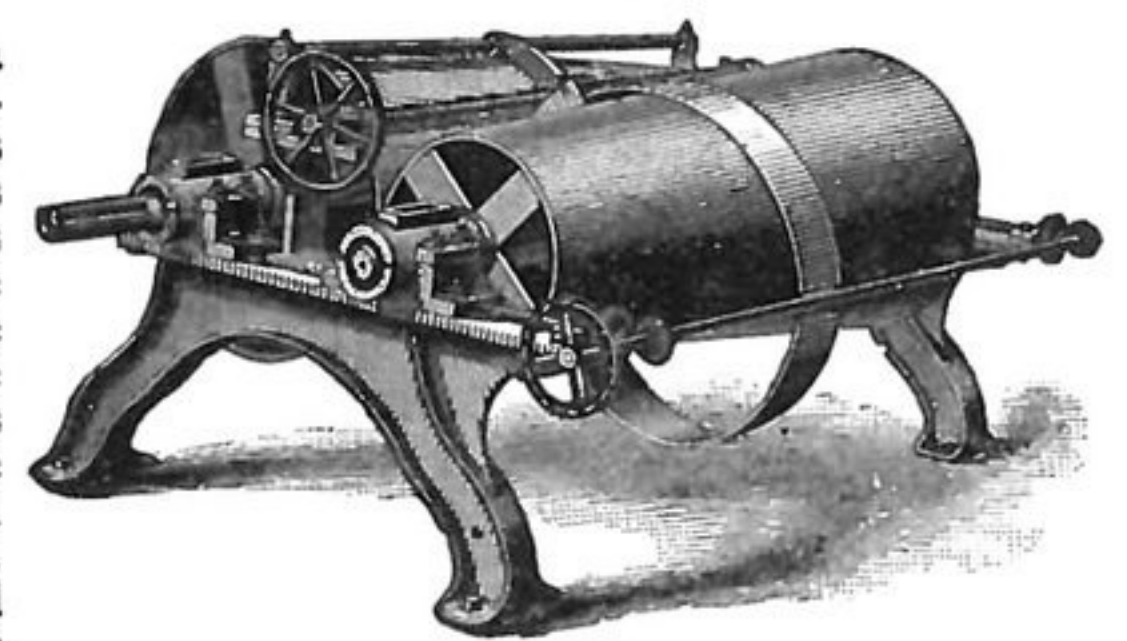
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EUROPEAN ECHOES.

THE amount of wheat used by the Budapest mills in 1888 is reported as 22,366,600 bushels against 19,066,600 bushels in 1887 and 17,783,300 bushels in 1886. The capacity of the mills is for about 23,833,300 bushels yearly, so that the present year's output required within less than 1,500,000 bushels of as much as they can grind.

THE estimated annual wheat consumption of the United Kingdom is 210,000,000 bushels of wheat, and flour as wheat. The home wheat undelivered is about 32,500,000 bushels. The supplies through imports and the deliveries of domestic wheat within about five months have been some 95,000,000 bushels of the 210,000,000 bushels required in the year to end Aug. 31 next.

SAYS the London "Economist": In a country so vast as Russia, where no exact information relative to the size and condition of the grain crops is obtainable, we should not be surprised at any thing. Looking merely at the so-called reports of the Russian Government it would seem as if but very little more wheat could be spared from that country, and yet every prominent point of shipment is reported to be full to overflowing, with unknown quantities still back in the country to come forward.

THE following table shows the gross imports of wheat and flour, the latter converted into wheat on the basis of 72½ per cent., into the United Kingdom for the 20 weeks ending January 19, 1889, compared with the corresponding periods of the two previous years and the estimated total sales of English wheat in the same period, in quarters of 480 pounds:

	1888-89.	1887-88.	1886-87.
	Qrs.	Qrs.	Qrs.
Wheat.....	6,062,537	4,562,634	4,426,149
Flour (as Wheat)....	1,960,570	2,412,558	2,019,442
English Wheat.....	3,072,575	3,854,505	2,945,347
Total.....	11,095,682	10,829,697	9,390,938

GRAIN and flour make up the greater portion of Russian agricultural exports, and the prices of other kinds of grain than wheat have been relatively quite as bad as wheat. The great increase of British imports of wheat from Russia in 1888 has encouraged a false impression. It will help to convince people that the mere increase in the Russian wheat surplus, after two good harvests in succession, is not necessarily a sign of prosperity or of ability on the part of Russian cultivators to keep on supplying western Europe at current prices. There is now a crisis in Russia, and the very first and foremost of the causes of the crisis, which a native writer has brought forward, is the general lowering of prices of grain in the international markets.

BEERBOHM states that the present attitude of the grain trade in the United Kingdom is one of watchfulness. There is no disposition to speculate while the present sufficiency of supplies lasts, but the most liberal estimates of future supplies and the most careful examination of the question show that it will be very difficult during the next six months to obtain necessary supplies from exporting countries. Present abundance seems, in fact, to have blinded the trade to its future position in this respect. With Australia and Chili unable to send the usual spring supplies, with India complaining of the new crop and with a shortage reported in the crop of the Argentine Republic, the only conclusion that can be arrived at is that prices must soon turn in favor of holders.

SAYS a London exchange: Of late there has been a great increase in the manufacture of flour in South Australia. The roller system has given it a great impetus, and the wheat is of such a quality that the millers are able to turn out flour that will command attention in any market. The "South Australian Register" says: "Only of late years has our flour been shipped to China, but during the present

season a large quantity has been sent to Hong Kong. For a number of years New South Wales and Queensland have purchased a great deal of flour from the colony, and during the last year about 20,000 tons have been sent to the former and 10,000 tons to the latter. South Africa got 3,000 tons, and other small lots were sent to Ceylon, New Caledonia and Cochin China. During the year ending September 30, 75,349 tons, valued at \$3,245,570, were exported. There are 85 flouring-mills in the colony, with a total horse-power of 1,951 and employing 614 hands.

BUILT TO RUN FOR ALL TIME.

Connecticut Yankees of a century or two ago appear to have been confident of their own ability to make things practically perpetual. For instance, in the history of Tolland county, in that State, the statement is made that the first grist-mill in the Town of Coventry was the subject of a curious proposition, which is recorded in the archives of that town as follows:

"att a Legall Town meating in coventry June 2 1712 the town then choos benjamin carpenter, nathaniel Rust, Peter Buell, david Lea, Ebenezer searls a committy to agre with som man about setting up and maintaining a mill to agre in behalf of the town and any 3 of this com'y shall have power to agree with a man in this matter."

Evidently the outlook for a flouring establishment in Coventry was not so flattering as might be desired, as the "man in this matter" did not put in his appearance until the year 1716. When he did appear to the "committy," he and the members thereof, after due deliberation, made an agreement. It is a curious document and reads as follows:

This Indenture, made on the 22nd of March, in the year of our Lord one thousand seven hundred and sixteen, and in the 2nd year of the reign of our Sovereign Lord, George of Britain, France and Ireland, King, Defender of the Faith, and between Jonathan Hartshorn, of the town of Norwalk, in the county of Fairchild, late of Coventry, in the county of Hartford, and the colony of Connecticut, in New England, on the part, and Thomas Root, Benjamin Carpenter, Nathaniel Rust, Peter Buell, David Lee, Samuel Parker and Timothy Alcott, all of the town of Coventry aforesaid, being a committee appointed and empowered by the town of Coventry to agree with the said Jonathan Hartshorn, in behalf of said town, about and for the building, erecting and maintaining a *Grist Mill* in the said town, and for giving said Hartshorn a deed of some land, viz: Sixty acres in two places, as by the act of the said town, March 17th, 1715, and March 5th, 1715, doth or may appear, on the part.

Witnesseth, That Jonathan Hartshorn, for and in consideration of the said sixty acres of land, secured by deed unto said Jonathan Hartshorn, upon consideration of his full compliance for himself, his heirs, his executors, administrators and assigns, for all times forever, hereafter, fulfilling and keeping all and every one of the articles and clauses and conditions hereafter mentioned, as in the said deed, bearing date with these presents, that he, the said Jonathan Hartshorn, his heirs, executors, administrators and assigns, shall, at his and their own proper cost and charge, build and erect a good and sufficient grist mill within the said town of Coventry, on the brook that issueth or runneth from the Great Pond, near the meeting house, and shall also keep and maintain the said grist mill in the said place forever, in good repair, so that it will be sufficient to grind all the corn that the inhabitants of said town shall at all times hereafter have need to be ground for their use, making as good meal as is or shall be generally made by other mills within the said colony, and I, the said Jonathan Hartshorn do covenant and promise to and with the said Thomas Root and Benjamin Carpenter to fulfill all the above conditions, for the further assurance of which I have hereunto set my hand and seal, the day and year first above written.

JONATHAN HARTSHORN. [L. S.]

Signed and sealed in the presence of us, and delivered.

JOSEPH TALCOTT.

JOSEPH PITKIN.

A true copy of the original.

Jan. 10, 1716.

Attest:

THOMAS ROOT, Register.

That mill was built on that site according to those specifications, and it is still running, although repeated repairs have practically removed or replaced nearly all of the material used in the original building. In those days men knew nothing of systems of milling, of improvements in milling, of millers' trusts or millers' conventions, and cheerfully entered into contracts that were to end with eternity.



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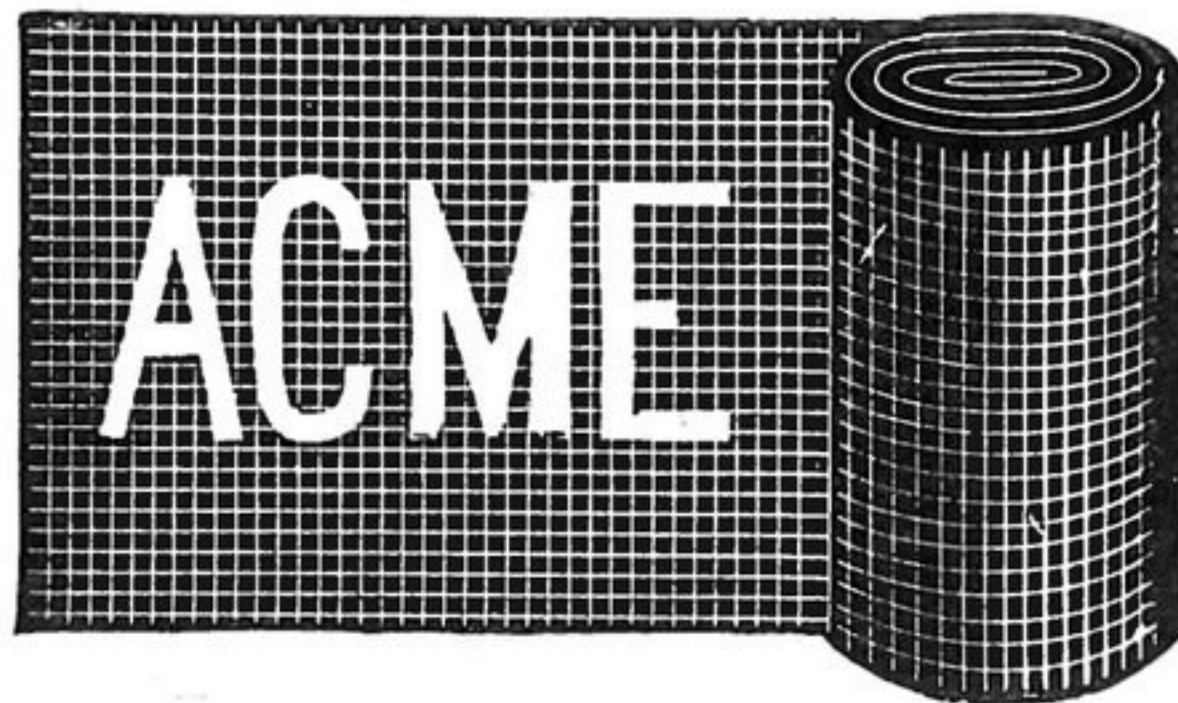
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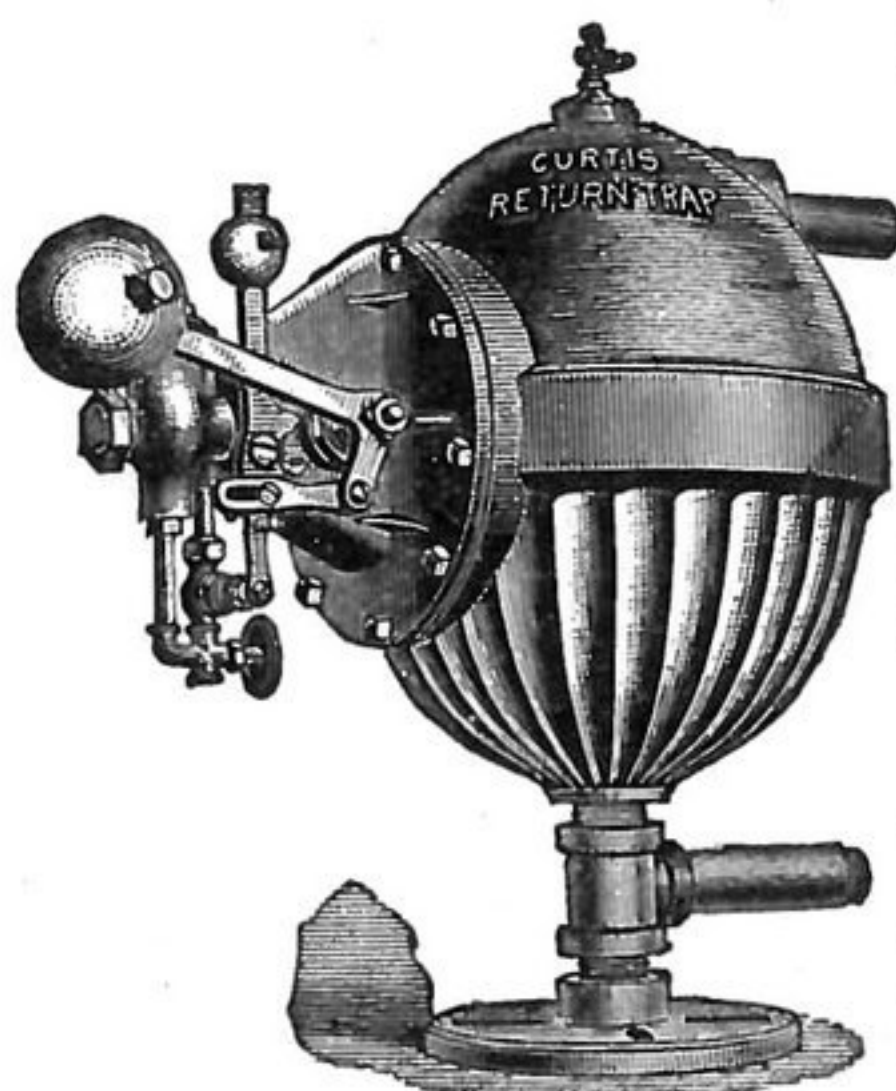
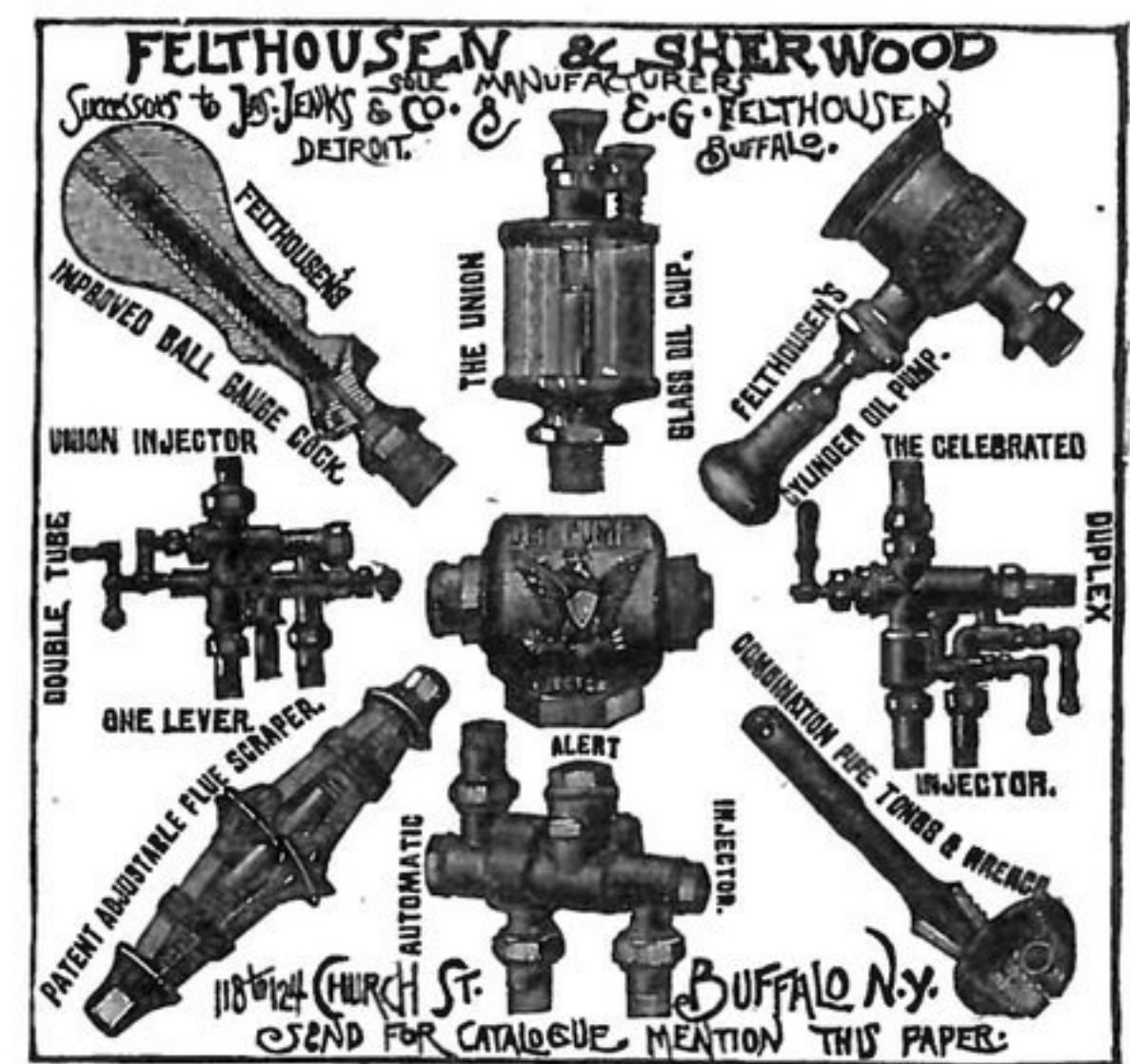
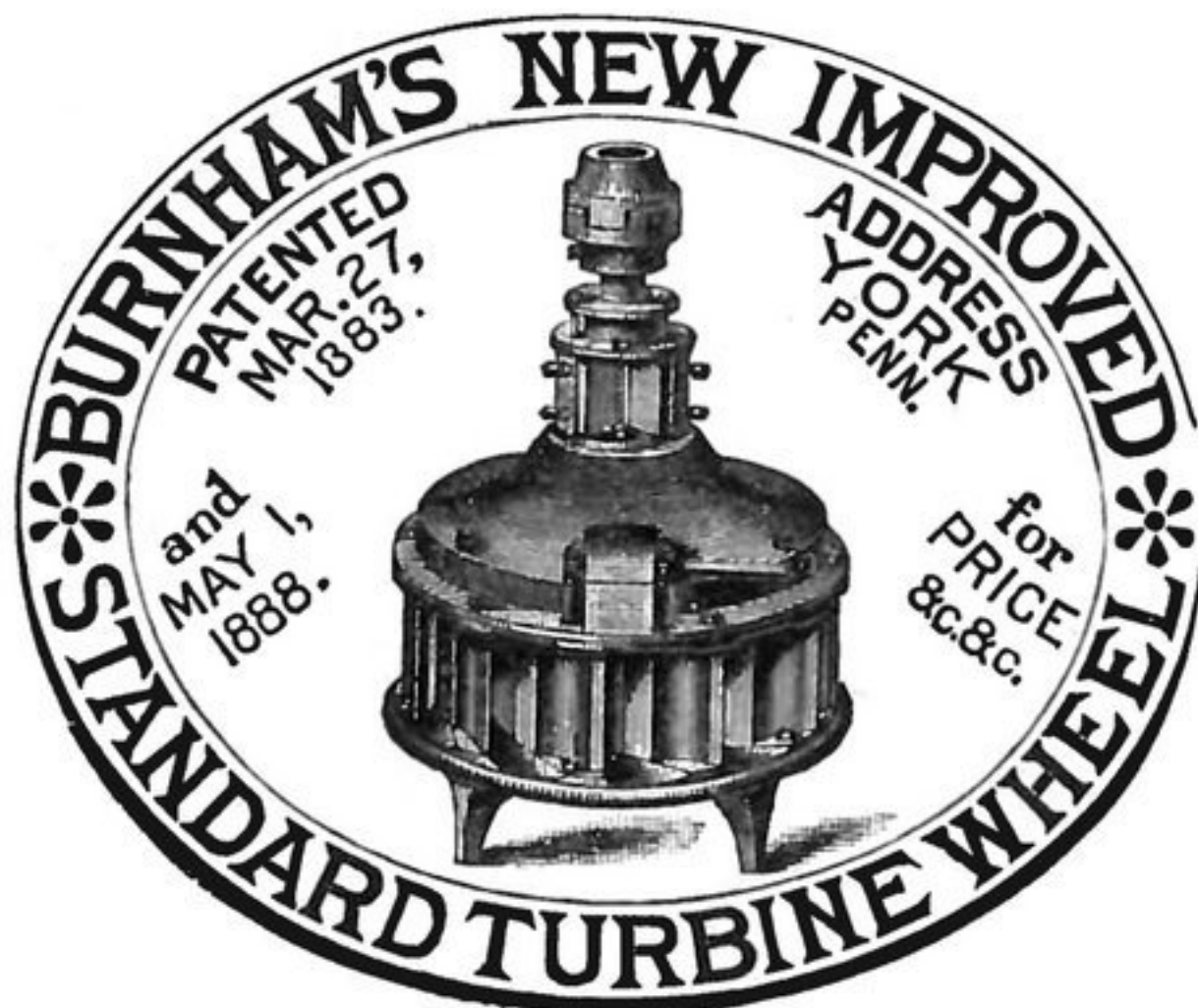
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OFFICE OF THE MILLING WORLD,
BUFFALO, N. Y., February 16, 1889.

On Friday of last week realizing by shorts sent the markets up slightly. February wheat sold up to 95 $\frac{1}{4}$ c. at closing and May at 99 $\frac{3}{4}$ c. in New York, while in Chicago February closed at \$1.01 and May at \$1.03 $\frac{3}{4}$. Options 2,200,000 bushels. February corn closed at 43 $\frac{3}{4}$ c. and oats at 30 $\frac{3}{4}$ c. Wheat flour was more active, but buyers were generally looking for "bargains." Exporters did nothing. The minor lines were featureless.

On Saturday the markets were dull on evening up, with prices rather steadier. February wheat closed at 95 $\frac{3}{4}$ c. Options 1,000,000 bushels. February corn ruled at 43 $\frac{3}{4}$ c. and oats at 30 $\frac{3}{4}$ c. Wheat flour was steady and unchanged. The minor lines were featureless.

Monday brought excitement, activity, irregularity and a decided advance in wheat and flour. February wheat in New York closed at 97 $\frac{1}{4}$ c., and May at \$1.00 $\frac{3}{4}$ c. and June at \$1.01 $\frac{1}{4}$ on export demand and covering by shorts. In Chicago February wheat closed at \$1.03 $\frac{1}{2}$, June at \$1.02 $\frac{1}{2}$ and May at \$1.05 $\frac{1}{2}$. Options 4,250,000 bushels. February corn closed at 43 $\frac{3}{4}$ c. and oats at 30 $\frac{3}{4}$ c. Wheat flour was more active at an advance of 5c. a barrel. Buyers took freely. Exporters held off. The minor lines showed no changes.

Tuesday was a regular bull day on wheat. The Chicago shorts were panicked by the reported Fairbanks pool, which began to show its hand. In New York February wheat closed at 98 $\frac{3}{4}$ c., April at \$1.01, May at \$1.02 $\frac{1}{4}$ and June at \$1.02 $\frac{1}{2}$. In Chicago February closed at \$1.06 $\frac{3}{4}$, May at \$1.09 $\frac{3}{4}$ and June at \$1.05. Options in New York 17,000,000 bushels, mostly of the May option. A Chicago dispatch during the day announced that at a meeting of millers in St. Louis it was agreed to advance the price of winter flour 15@20c. a barrel. Corn ruled dull, with February at 43 $\frac{3}{4}$ c. and oats at 30 $\frac{3}{4}$ c. Wheat flour was stronger with wheat, but the advance checked business. Holders generally asked 10c. advance, and sales were not large. The minor lines were quiet.

The visible supply in the United States and Canada was:

	1889.	1888.	1887.
Feb. 9.	Feb. 11.	Feb. 12.	
Wheat.....	34,190,376	40,287,617	61,322,543
Corn.....	14,035,108	3,339,156	16,824,701
Oats.....	8,079,829	5,181,537	4,964,720
Rye.....	1,697,916	361,283	438,730
Barley.....	2,236,805	2,803,169	2,121,743

On Wednesday the breadstuff markets collapsed on free realizing by longs on the outside and small traders. February wheat in New York closed at 96 $\frac{3}{4}$ c., May at \$1.00 $\frac{1}{4}$ and June at \$1.00 $\frac{1}{2}$. In Chicago February closed at \$1.04 $\frac{3}{4}$ and May at \$1.08. Options in New York 6,000,000 bushels. February corn ruled at 43 $\frac{3}{4}$ c. and oats at 30 $\frac{3}{4}$ c. Wheat flour was moderately active at the opening, but as wheat broke buyers held off to see where the break would stop. The minor lines were featureless.

On Thursday an absence of good buying, with scattered realizing, weakened the markets all around. In New York February wheat closed at 96c. and May at 99 $\frac{1}{2}$ c. Options 4,200,000 bushels. In Chicago February closed at \$1.03 $\frac{1}{2}$, May at \$1.06 $\frac{3}{4}$ and June at \$1.03 $\frac{3}{4}$. February corn closed at 44c. and March oats at 31 $\frac{1}{2}$ c. in New York. Buckwheat grain was 51c. and rye 55@56c. on track for State and 53@54c. for Jersey and Pennsylvania. Barley was held at 70@75c. for 2-rowed State, 74@75c. for 6-rowed, and 70@80c. for the whole range of Canada. Mill-feed was firm at the following quotations: 70c for 40-lb and 65c for 60-lb; 80-lb. 70c; 100-lb. 85c; sharps, 85@95c; 80c for rye; screenings,

50@80c; oil meal, \$1.45@1.50; cotton meal, \$1.25@1.28; barley meal, 90c.

Wheat flour was very dull, and buyers were unwilling to buy on a weak market, except at lower prices. Sales were small. Following are the quotations:

SPRING FLOUR.		
	Sacks.	Barrels.
No grade.....	\$2.00@2.25	\$....@....
Fine.....	2.25@2.50	2.60@2.90
Superfine.....	2.75@3.30	3.30@3.45
Extra No. 2.....	3.40@3.55	3.55@3.75
Extra No. 1.....	3.80@4.50	3.90@4.50
Clear.....	4.00@4.80	4.55@5.05
Straight.....	5.30@5.80	5.80@6.05
Patent.....	5.90@6.55	6.40@6.95

WINTER FLOUR.		
	Sacks.	Barrels.
No grade.....	\$2.90@2.25	\$....@....
Fine.....	2.60@2.85	2.80@3.00
Superfine.....	3.25@3.40	3.35@3.50
Extra No. 2.....	3.40@3.55	3.70@3.90
Extra No. 1.....	3.80@4.80	5.05@5.55
Clear.....	4.35@4.65	4.55@4.95
Straight.....	5.05@5.25	5.05@5.65
Patent.....	5.30@5.65	5.45@6.30

CITY MILLS.		
W. I. grades.....	\$5.15@5.30	
Low grades.....	2.45@2.85	
Patents.....	6.05@6.75	

Rye flour was dull at \$3.00@3.15. Buckwheat flour was dull and easy at \$2.00@2.20. Corn products were slack at the following quotations: Brandywine and Sagamore, \$2.90; Southern and Western, \$2.75@2.85; coarse meal, 80@85c; fine yellow, 98c@1.00; fine white, \$1.03@1.05; Southern, 80c@1.20 for coarse and fine in bags; grits, \$2.50@2.60.

BUFFALO MARKETS.

FLOUR—City ground—Patent spring, \$7.25@7.50; straight Duluth spring, \$6.50@6.75; bakers' spring, best, \$6.00@6.25; do rye mixture \$5.25@5.50; patent winter \$7.00@7.25; straight winter \$5.75@6.00; clear winter \$5.50@5.75; cracker \$5.50@5.75; graham \$5.50@5.75; low grade \$3.00@4.25; rye 3.50@3.75 per bbl; buckwheat \$2.50 per cwt. **OATMEAL**—Akron \$6.00; Western \$5.75 per bbl; rolled oats in cases, 72 lbs, \$3.25. **CORNMEAL**—Coarse, 80c; fine 85c; granulated \$1.50 per cwt. **WHEAT**—Chicago May opened at \$1.07 $\frac{3}{4}$, highest \$1.08 $\frac{3}{4}$, lowest \$1.06 $\frac{3}{4}$, and closed at \$1.07. Limits were 31@32c. over for old, new 23c, No. 1 Northern 14c, No. 2 Northern 9@10c, No. 2 spring 5c over Chicago May. The sale reported was 3,000 bu old at \$1.37 $\frac{1}{2}$. Old closed at \$1.88@1.39, new \$1.30, No. 1 Northern \$1.21; No. 2 Northern \$1.16@1.17; No. 2 spring \$1.12. Winter wheat in fair demand. A sale of 10,000 bu No. 3 red was made late Wednesday afternoon. The grain is to go to Cleveland and the price was understood to have been made by its owners in New York. 10,000 bu of No. 2 red were sold at 90 $\frac{3}{4}$ c, and 4,500 bu do at 90 $\frac{1}{2}$ c; sale 1 carload No. 2 red at \$1.07; No. 1 white held at \$1.09 to arrive. On a basis of 6c over Detroit No. 1 white closed at \$1.08 $\frac{1}{2}$ and No. 2 red at \$1.07. **CORN**—Demand moderate, market closing weak; sales 500 bu old No. 2 at 40c; 6 carloads No. 3 yellow at 36 $\frac{1}{2}$ c, 2 do No. 3 at 35 $\frac{1}{2}$ @36, 1 do No. 3 white at 36 $\frac{1}{2}$ c, and 5 do No. 4 yellow at 36c. **OATS**—Quiet and weak; sales 5 carloads No. 2 white at 32c; No. 3 white offered at 29 $\frac{1}{2}$ @30 $\frac{1}{2}$ c; white state from wagons 34c. **BARLEY**—Dull; No. 1 Canadian, 71@75c; No. 2, 68@70; No. 3 extra, 65@66c; No. 58@6 c. **RYE**—No. 2 Western offered at 54c; no inquiry. **RAILROAD FREIGHTS**.—To New York, Baltimore and Philadelphia rate points on grain flour, and feed, 13c. per 100 lbs; to Albany and West Troy, 10 $\frac{1}{2}$ c; and to Boston, 15c.

A Minneapolis dispatch of Feb. 14 says: The flour output last week was 90,480 barrels, against 97,500 barrels the previous week and 118,100 barrels the corresponding time in 1888. The higher wheat markets have stimulated the flour trade to a considerable extent. Flour prices were advanced 10 cents per barrel on Monday night, and 25 cents more on Tuesday. One firm reported sales of over 60,000 barrels in the past 10 days. The stock at Duluth on Saturday was reported at 50,000 barrels. There were 382,240 bushels of wheat received at Minneapolis for the week; shipments wheat 147,840 bushels; flour 86,557 barrels.

According to a dispatch from St. Louis a discovery of the greatest importance to farmers has been made. It is that the control of the barbed-wire patents is not vested in any American firm or corporation, because the device of barbed wire was patented in France, to Louis Janin, on April 19, 1865. The law of this country, as declared by the United States Supreme court, is that "A foreign patent for the same thing, or a description of the thing in a foreign publication, is as effectual to void a patent as if the patentee had seen the prior invention, notice to him not being important." Under this decision claims for royalty under the Glidden and other barbed-wire patents are worthless.

Corle & Sons' oatmeal mills, Kansas City, Mo., were fired by an explosion of dust and damaged \$20,000; fully insured.

M. A. McKown, grist-mill, LaCrosse, Wis., sold out.

New Improved Patent Head Linings.



DESCRIPTION.

These Linings are curved edgewise and flatwise, besides having the edge beveled, so as to make them fit the head and chine PERFECTLY, without springing them edgewise when nailing.

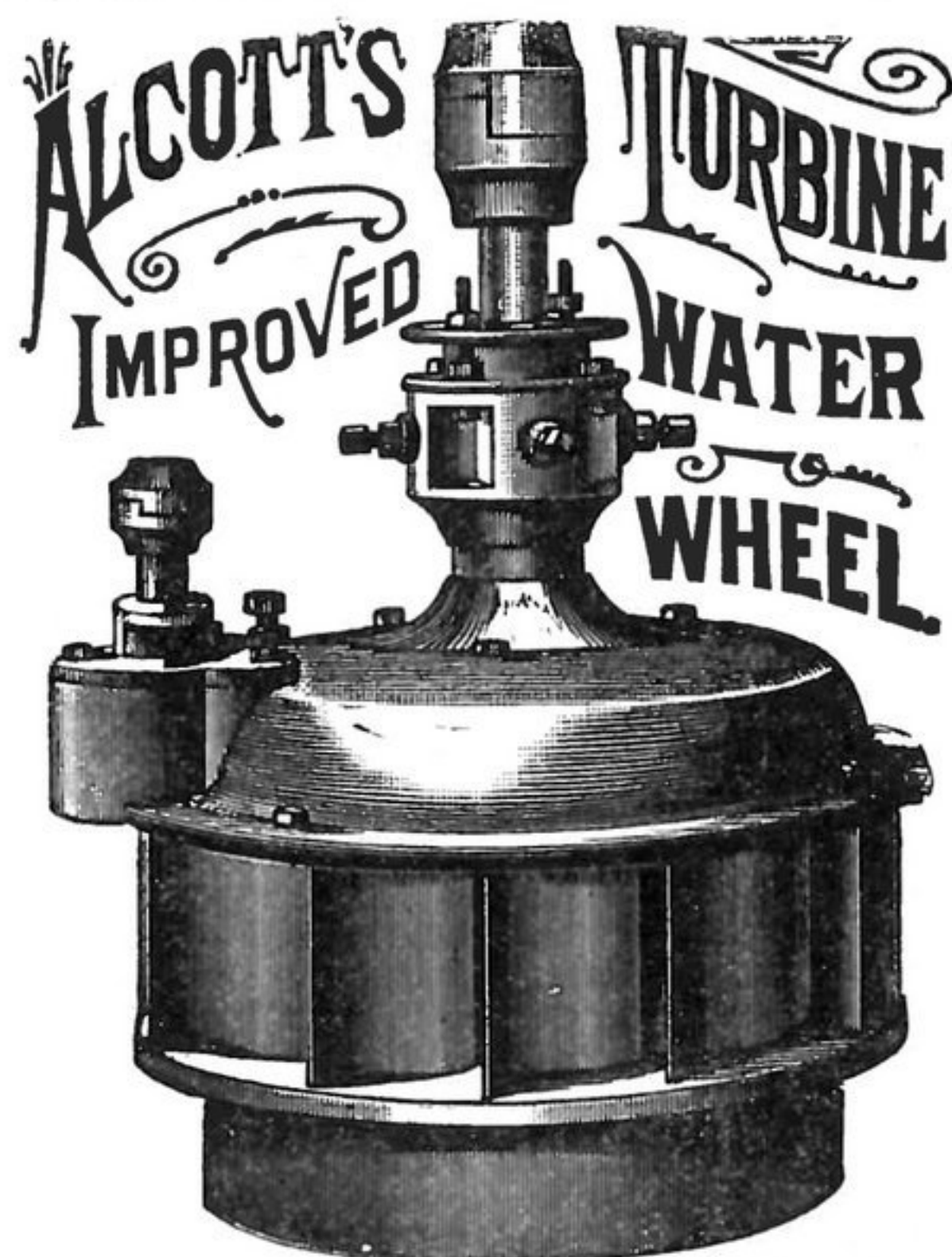
If you use them once you will have NO OTHER. No need of pounding fingers, as the ends do not have to be held down while nailing. They are much more convenient to nail and look better than any other. They are first tied in bundles of two hundred, and, when dry, are put into bales, weighing about fifty pounds each, and tied with two strong wires, to make them handle better and to prevent loosening out in transit.

Write for prices and state about the number you use per year.

To convince you of their merit, and for the purpose of introducing them, I will ship a sample order of from five to ten thousand at a REDUCED RATE.

SEND US A TRIAL ORDER. SATISFACTION GUARANTEED.

J. H. PETERS,
Owner of Patent and Manufacturer,
COLEMAN, MICH.



THIS WHEEL GIVES HIGH RESULTS, AND IS ACKNOWLEDGED THE BEST, MOST PRACTICAL AND EFFICIENT TURBINE MADE. FOR SIMPLICITY, DURABILITY, AND TIGHTNESS OF GATE IT HAS NO EQUAL.

State requirements and send for Catalogue to

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Benefits OF NEW YORK

\$5,000. for DEATH. \$5,000. for LOSS of LIMBS.
2,500. for LOSS of LIMB. 2,500. SIGHT.
1,250. TOTAL DISABILITY. 650. ONE EYE.
25.00 WEEKLY INDEMNITY FOR 26 WEEKS.
ONE SET OF INDIVIDUAL REGISTRY PLATES INCLUDED.

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GIVES MORE POWER USING LESS WATER THAN ANY OTHER WHEEL.

THE OLD RELIABLE — LEFFEL — WATER WHEEL.

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SPRINGFIELD, O., OR 110 LIBERTY ST., N. Y.



THE "HARLOW" Positive Feed Lubricators.

For Marine and Stationary Engines, Steam Pumps, Electrical and other Machinery.

MAXIMUM ECONOMY IN OIL.
MARKED ECONOMY IN FUEL.

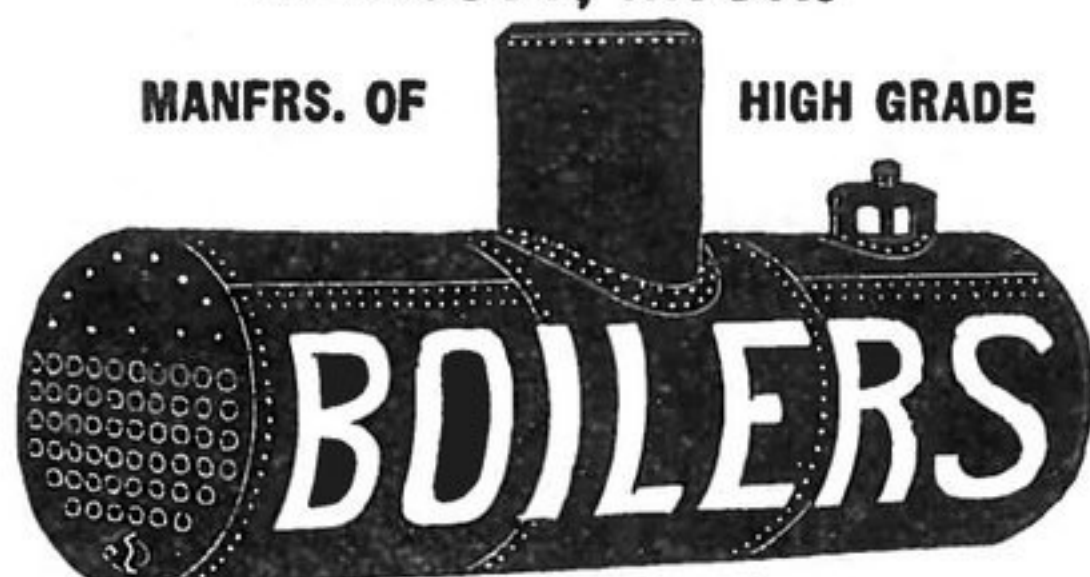
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Not affected by changes of temperature.

BEING operated by some moving portion of the engine or machine to be lubricated, the "Harlow Lubricator" starts and stops with the engine or machine being lubricated, without requiring the slightest attention from the engineer or operator, always delivering the oil in any amount from a drop to a constant stream.
The cup can be filled at any moment while the engine or machine being lubricated is in operation, without causing any leakage either of oil or steam.

Harlow Lubricator Mfg. Co. BOSTON, Mass.
U. S. A.

EAGLE IRON WORKS, DETROIT, MICH.

MANFRS. OF HIGH GRADE



HORIZONTAL, UPRIGHT
PORTABLE AND MARINE.

Oil Tanks & Smoke Stacks,

HEAVY SHEET IRON WORK.

CORRESPONDENCE SOLICITED.

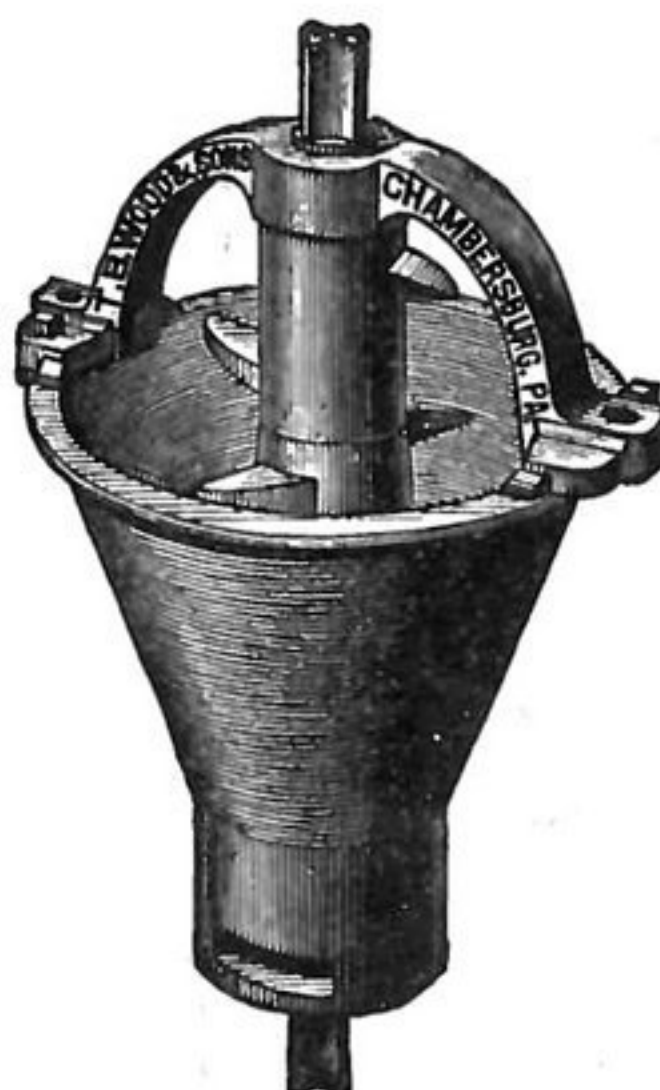
THE BEST AND CHEAPEST CORN AND COB CRUSHER IN THE WORLD.

All wearing parts cast of a steel mixture. Notice difference in construction. Most area where most work is done, where all other crushers have least area where most work is done. Low priced machinery is not the cheapest, considering durability and efficiency. Sent on 30 days' trial when satisfactory reference is furnished.

Please Send for Circulars.

R. C. McCULLEY, LANCASTER, PENN.

\$15 Will Buy the Best and Cheapest
CORN AND COB CRUSHER
IN THE WORLD!



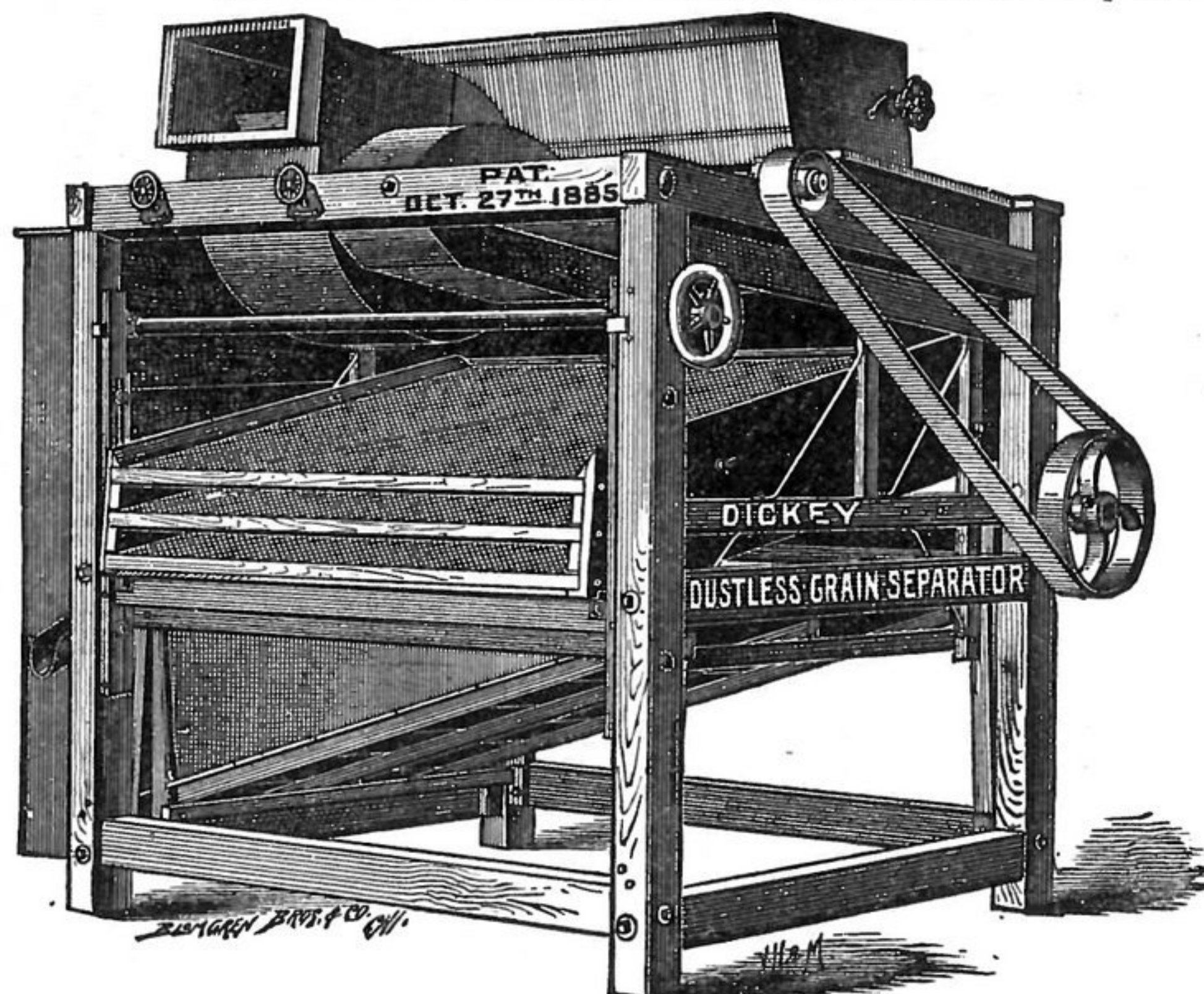
It can be driven either from above or below. Thousands of these Crushers are now in use throughout the United States and Canada, and are giving entire satisfaction. Send for circular, giving testimonials from millers who are using our Crusher, and know a good thing when they see it.

T. B. WOOD & SONS, CHAMBERSBURG, PA.

DICKEY DUSTLESS GRAIN AND FLAX SEPARATOR

This Separator is our latest and most perfect, and guaranteed to be the superior of any now on the market. This machine, as can be seen by the cut, is not a warehouse fanning mill with one patent attachment, but is a Dustless Separator, made for the express purpose of thoroughly cleaning and separating all kinds of grain in large quantities; its construction is such that the working machinery and weight is all within the parts or anchors.

WE CLAIM FOR IT SUPERIORITY.



WE CLAIM FOR IT SUPERIORITY.

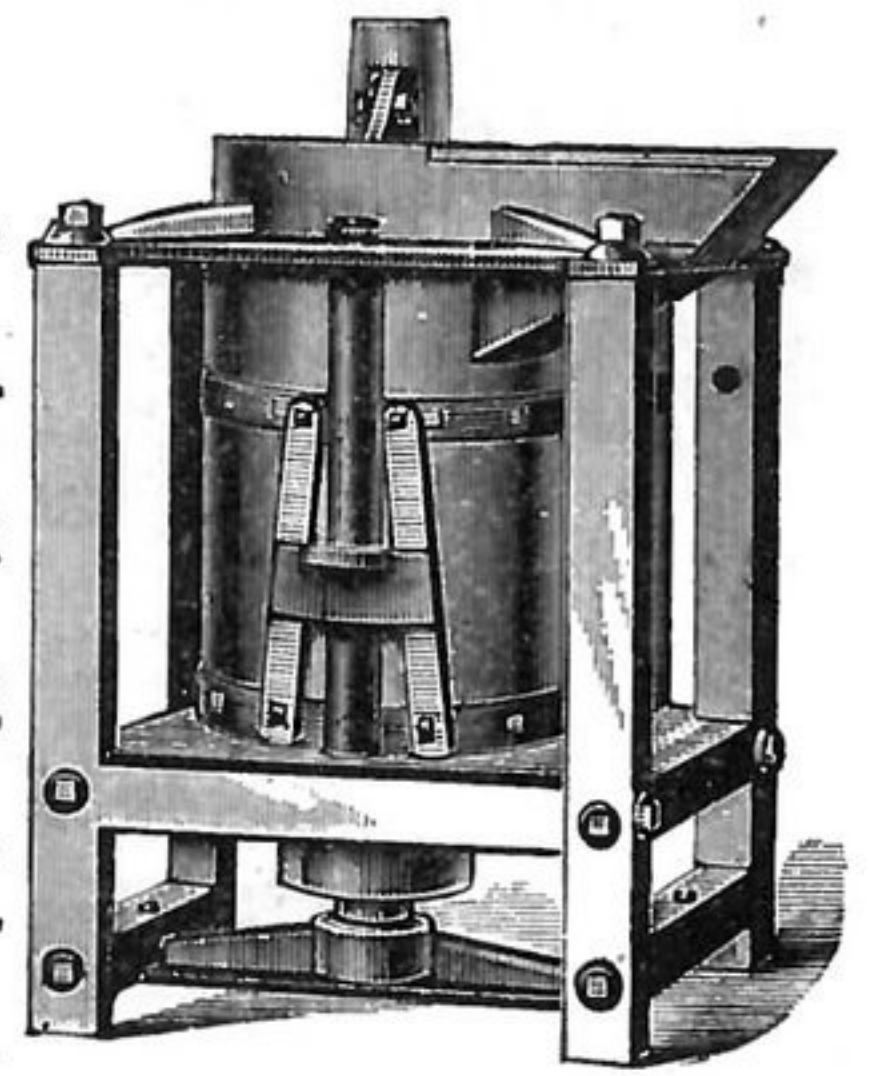
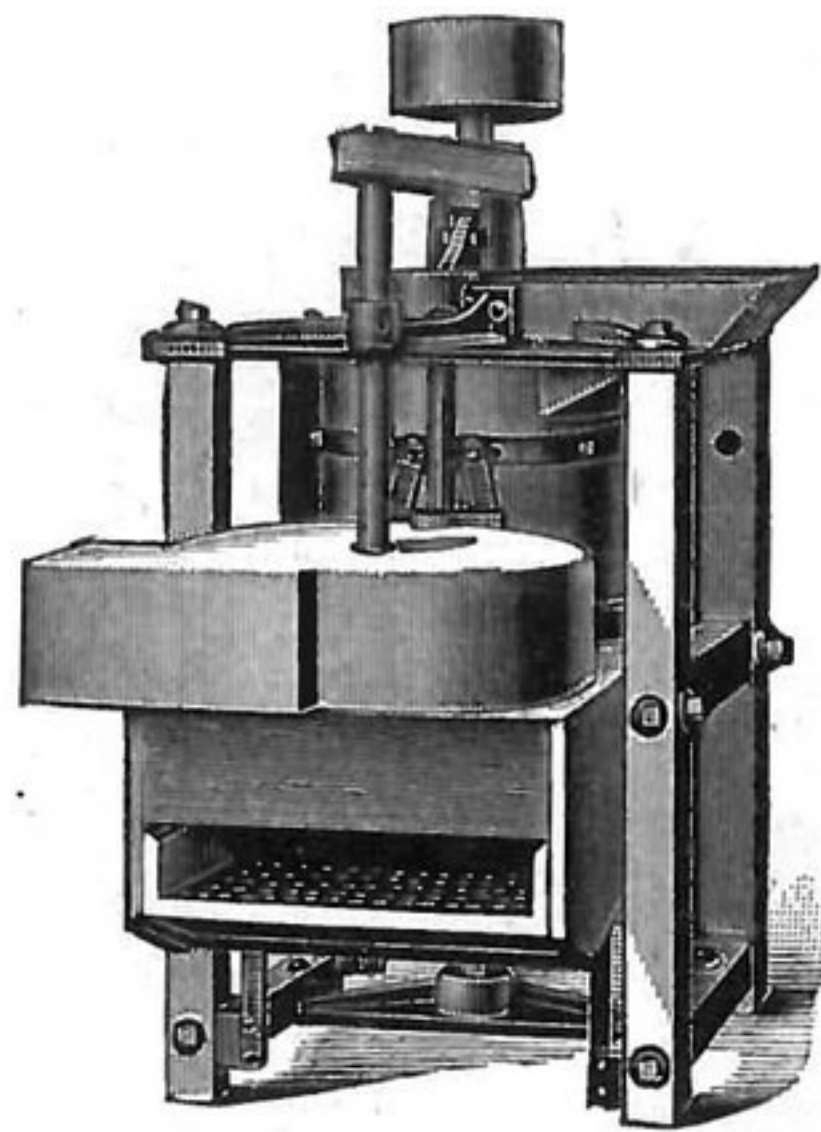
We claim for it Superiority over everything of the kind made, in simpleness, durability, saving of power, capacity and cost of construction. Its height will accommodate any number of spouts from different points, without moving machine. They have a capacity from 700 to 1,500 bushels per hour. We also control exclusively the manufacture of the celebrated Dickey Giant, End and Side Shake, Warehouse Mills, that have attained such a world-wide reputation. Sent on approval to any reliable party. For full particulars address,

A. P. DICKEY MANUFACTURING CO. Successors to **Dickey & Pease, RACINE, WIS.**

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Can find out a great deal about
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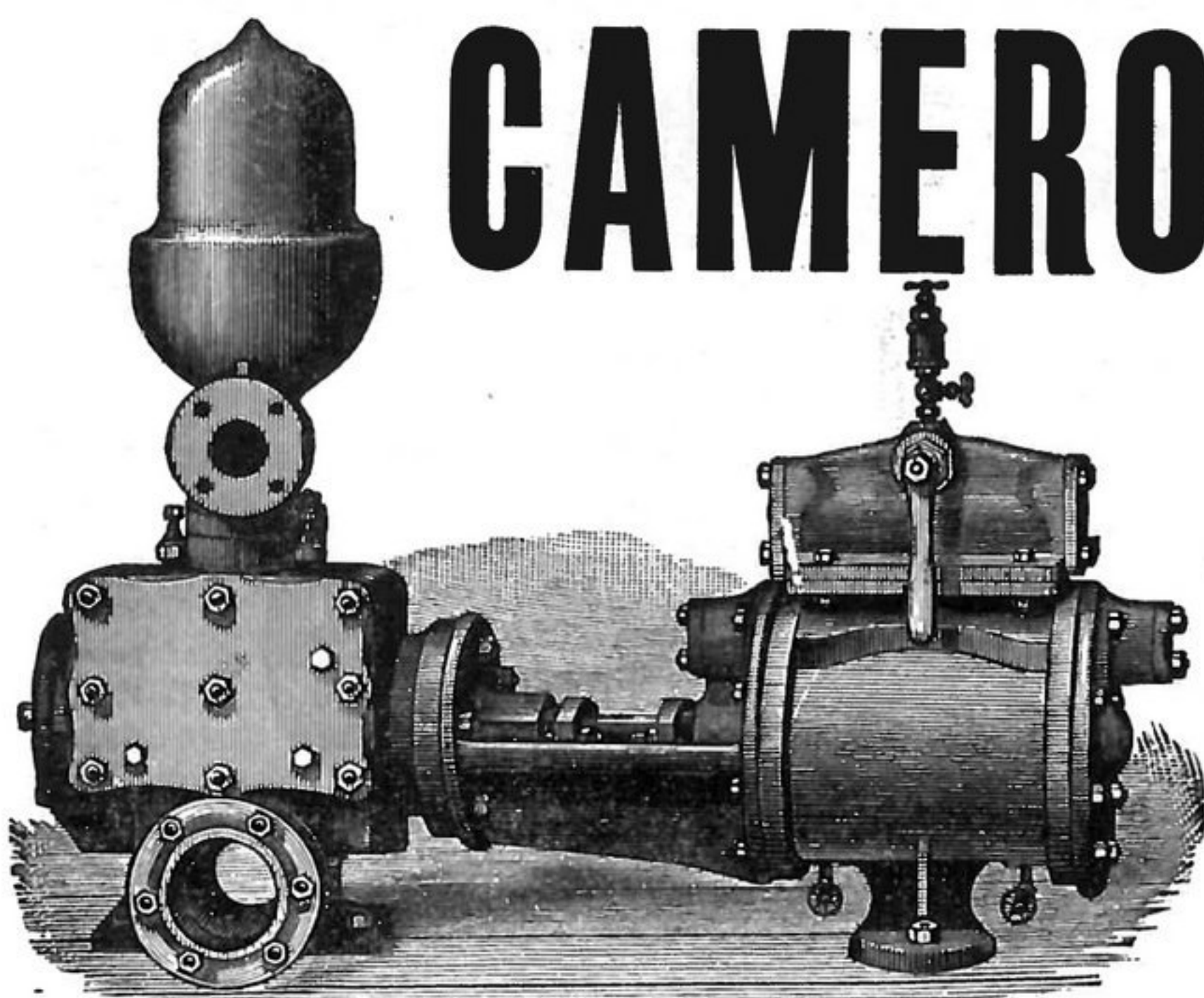
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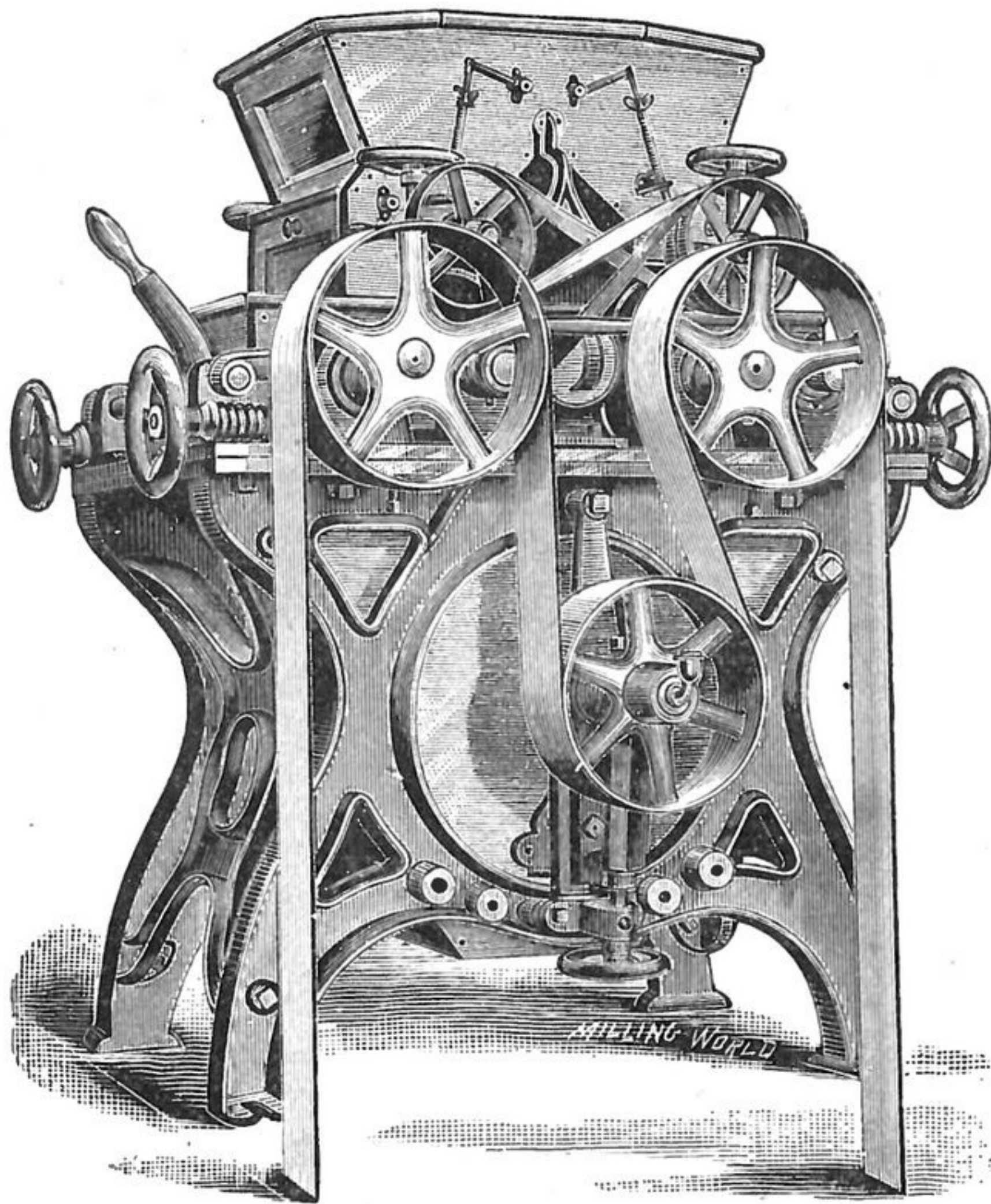
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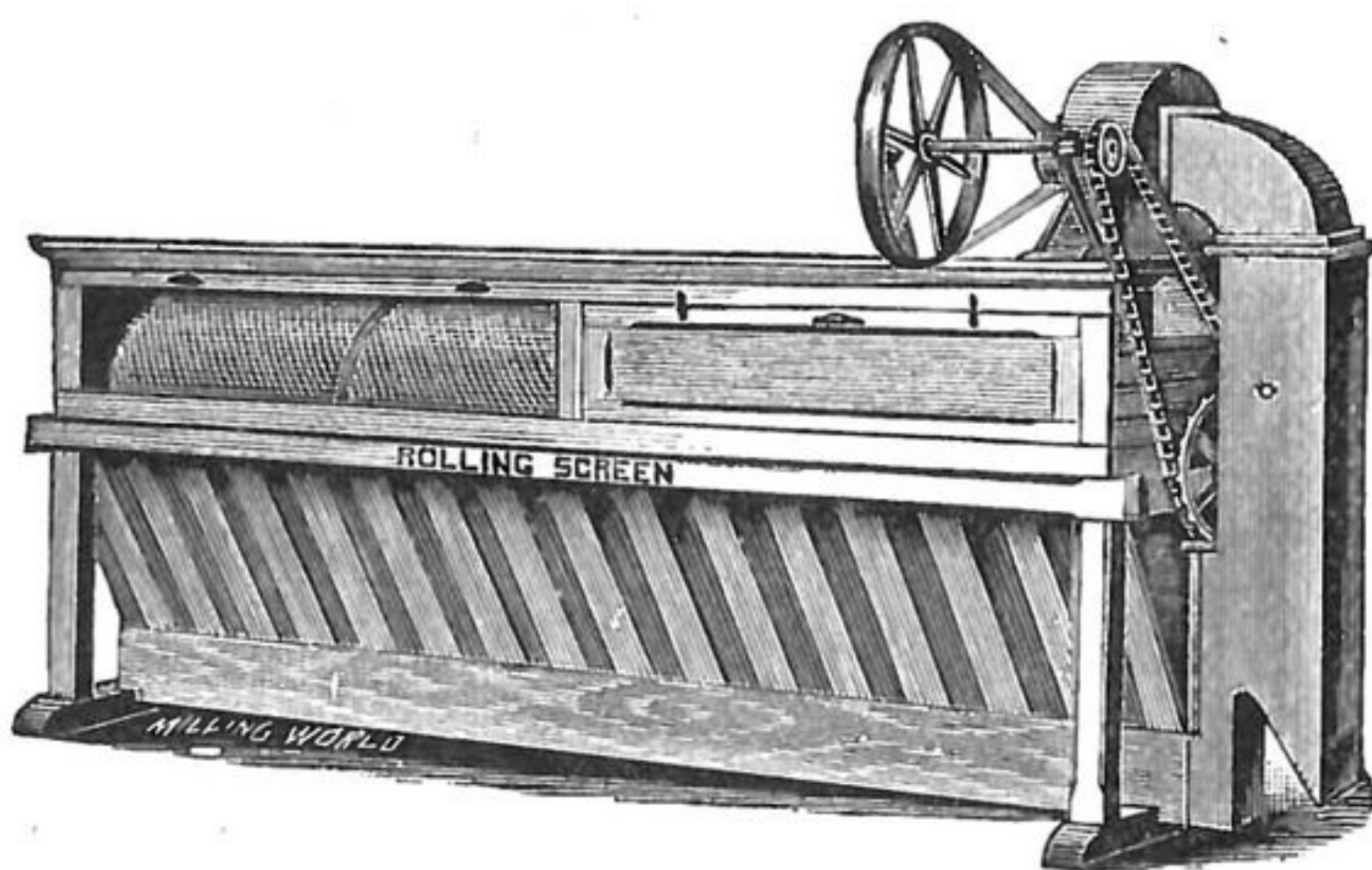
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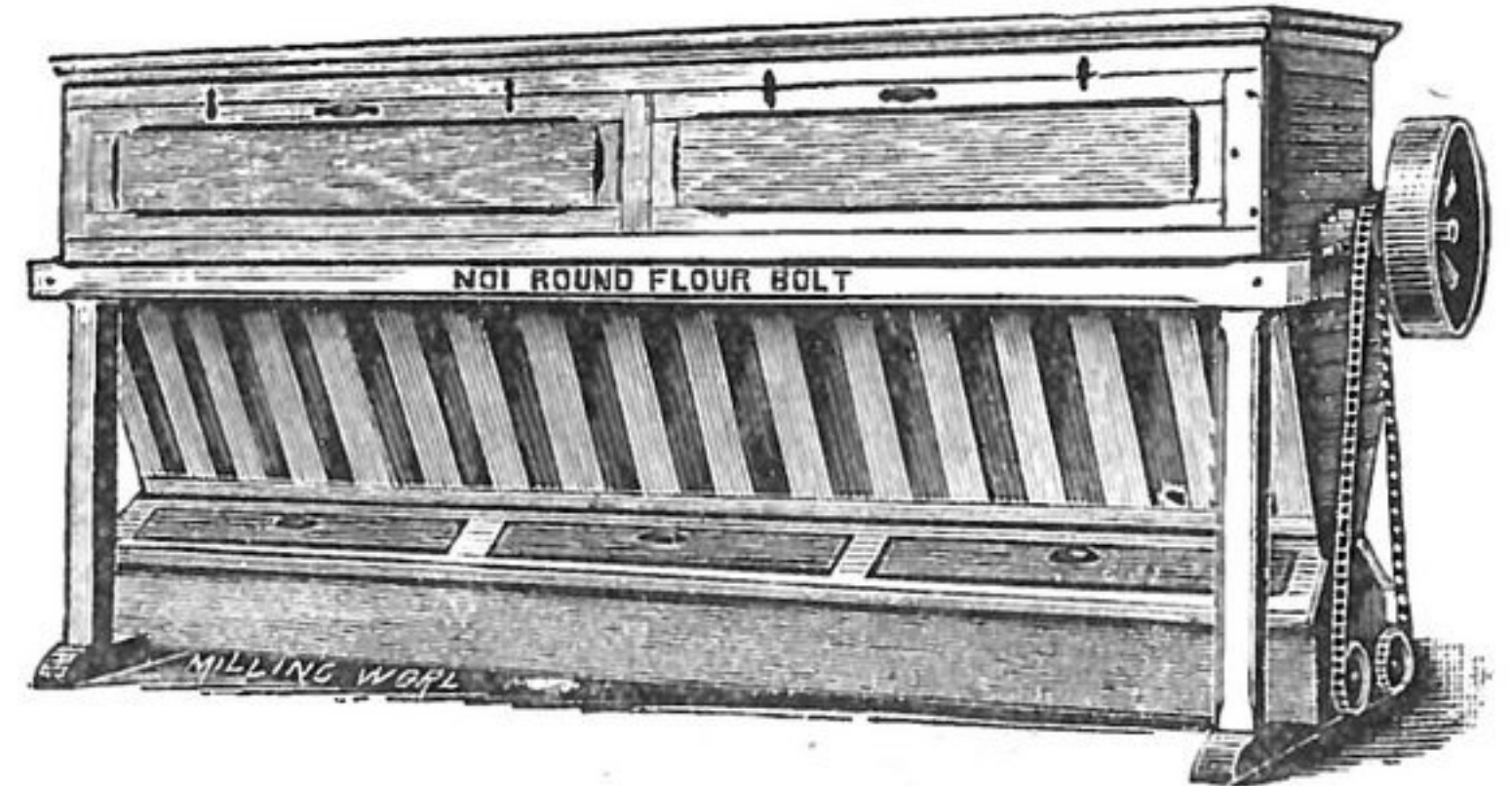
6x12 inch.
6x15 "

6x18 inch.
6x20 "

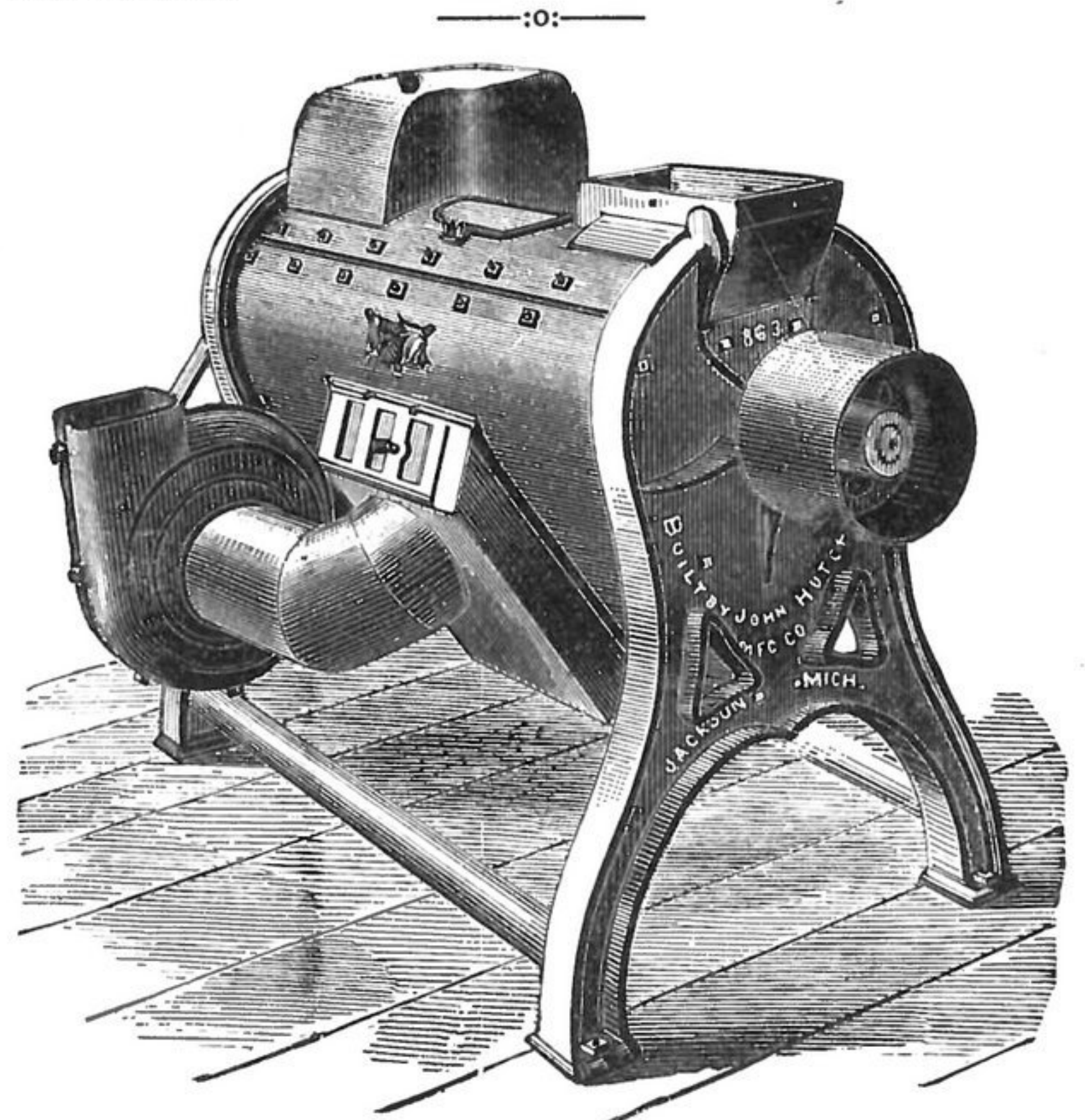


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Hutchison's New Dustless Iron Corn Sheller, especially adapted for Mill and Elevator use.

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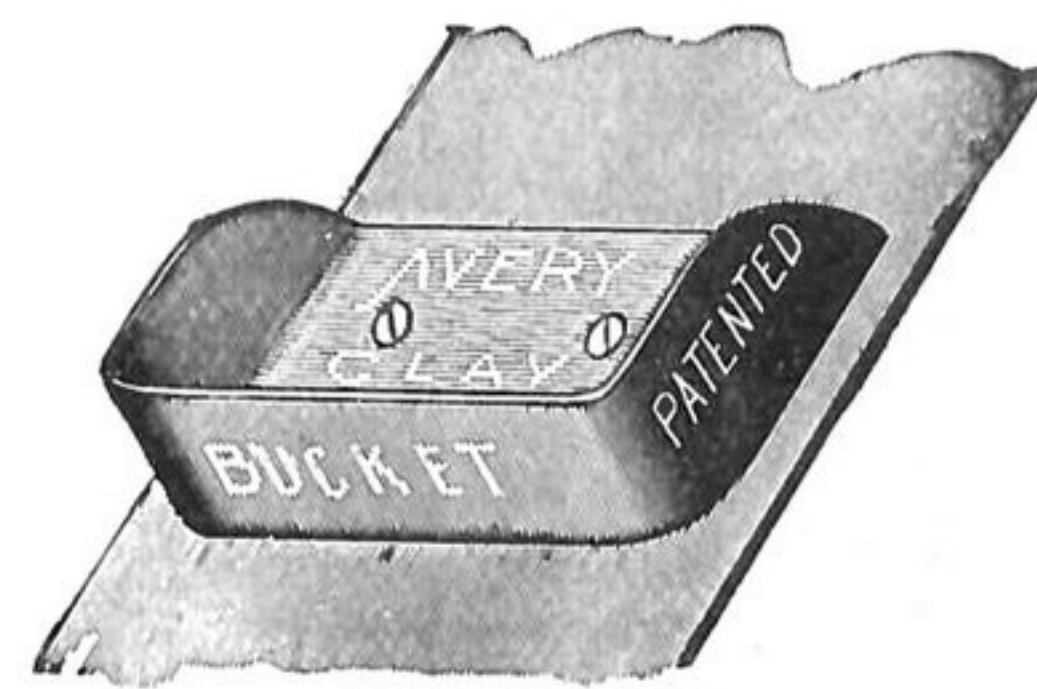


ELEVATOR BUCKET.

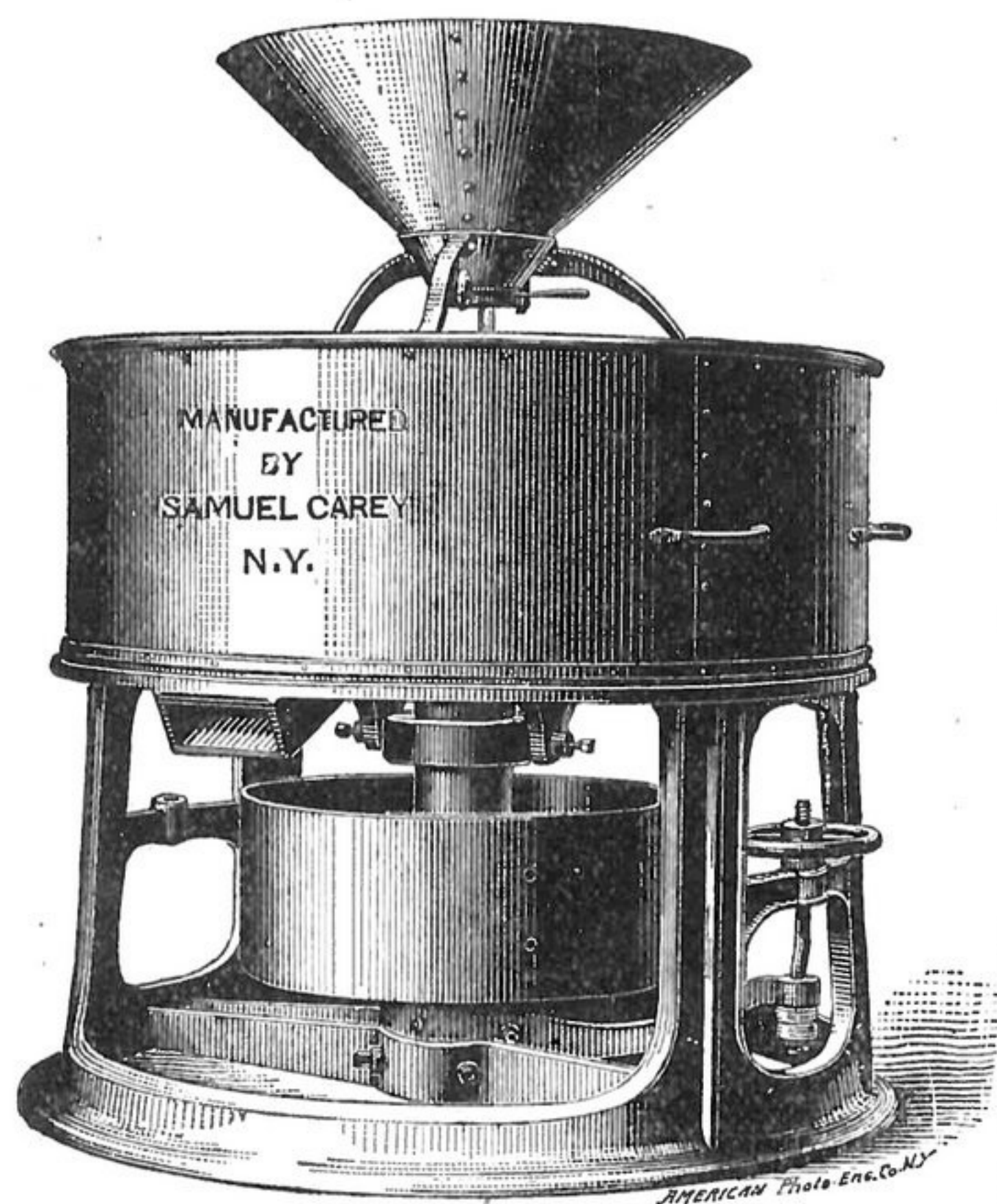
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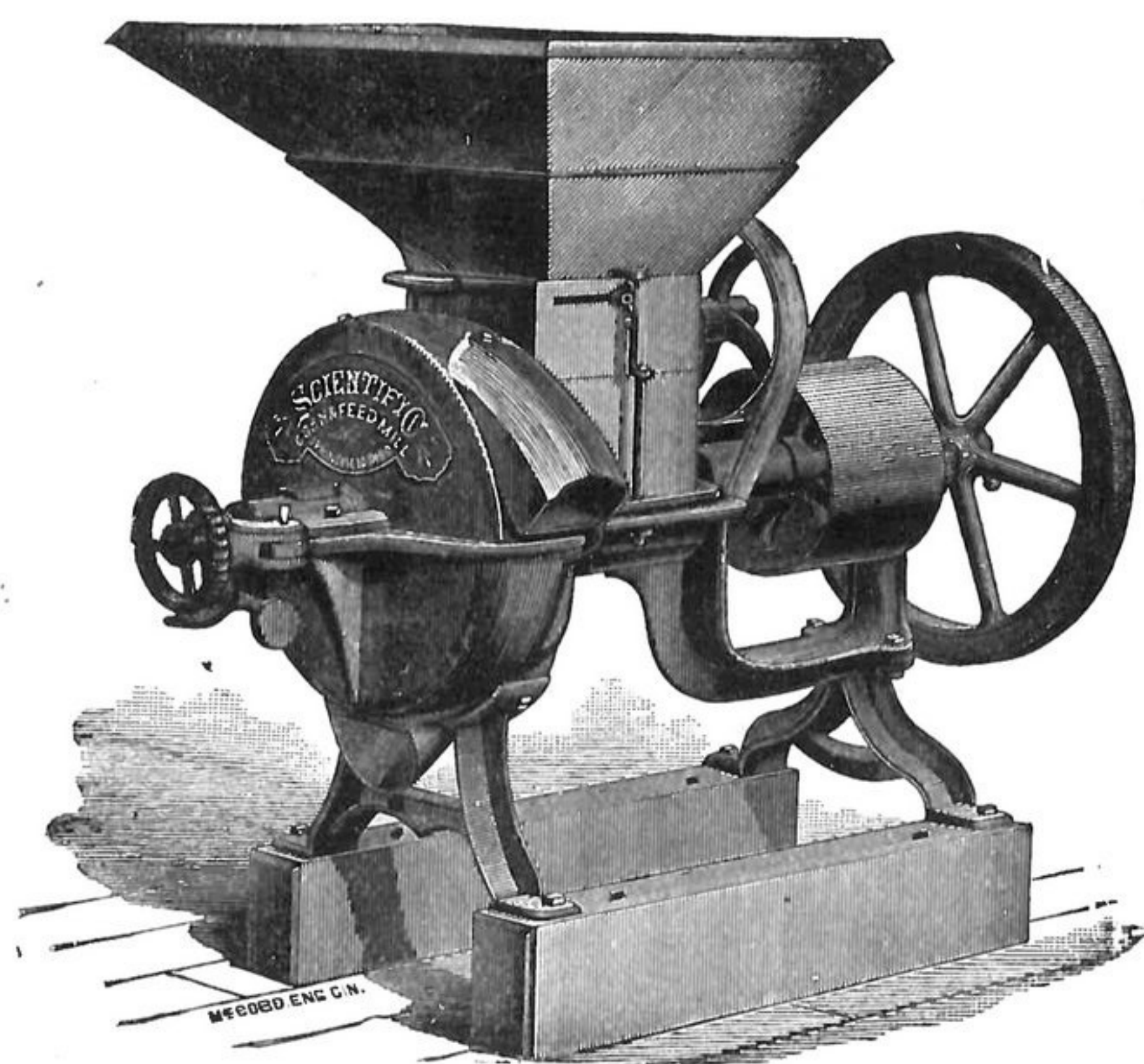
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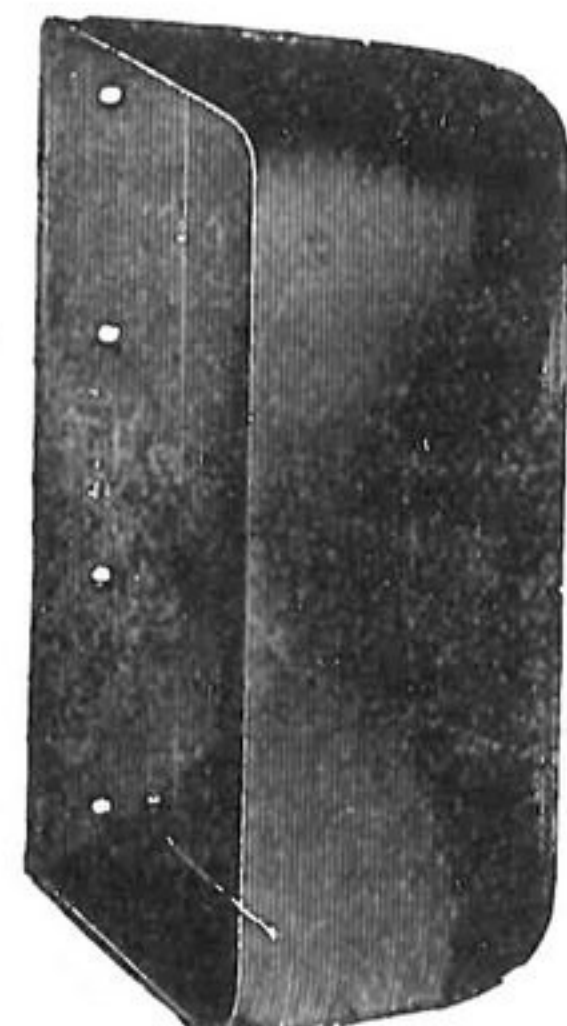
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